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EDWARD LISLE ESQ.

S.F. Ravenet Sculp.

OBSERVATIONS
IN
HUSBANDRY.

By EDWARD LISLE, Eſq;
LATE OF
CRUX-EASTON, in HAMPSHIRE.

> *Satis mirari non poſſum, quòd animi ſibi quiſque formatorem præceptoremque virtutis è cœtu ſapientium arceſſat; ſola res ruſtica, quæ ſine dubitatione proxima & quaſi conſanguinea ſapientiæ eſt, tam diſcentibus egeat quam magiſtris. Adhuc enim ſcholas rhetorum, & geometrarum, muſicorumque, vel, quod magis mirandum eſt, contemptiſſimorum vitiorum officinas, guloſius condiendi cibos, & luxurioſius fercula ſtruendi, capitumque & capillorum concinnatores non ſolum eſſe audivi, ſed & ipſe vidi: agricolationis neque doctores qui ſe profiterentur, neque diſcipulos cognovi. Cùm etiam, ſi prædictarum artium civitas egeret, tamen, ſicut apud priſcos, florere poſſet reſpublica; nam ſine ludicris artibus, atque etiam ſine cauſidicis olim ſatis felices fuere futuræque ſunt urbes; at ſine agricultoribus nec conſiſtere mortales, nec ali poſſe manifeſtum eſt.* COLUMELLA, lib. I.

LONDON:
Printed by J. HUGHS, near Lincoln's-Inn-Fields:
For C. HITCH and L. HAWES, J. RIVINGTON and J. FLETCHER, in Pater-noſter-row;
J. RIVINGTON, in St. Paul's Church-yard; W. SANDBY, in Fleet-ſtreet;
And R. and J. DODSLEY, in Pall-mall.
MDCCLVII.

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AS I think myſelf obliged to make ſome apology for the uncommon form in which the following obſervations are offered to the public, I beg leave to detain the reader a few moments, in giving him a ſhort account of my father's deſign in making and collecting them, with the method he purſued in it, and the reaſons that induced me to print them in the manner they now appear.

To enter into a detail of the author's life and character would, in my opinion, be no ways neceſſary to this work, nor could I perhaps ſay many things I know of him, without drawing ſome imputation of vanity on myſelf. It may be ſufficient therefore to take notice, that he ſettled at Crux-Eaſton in Hampſhire, as far as I can collect, about the 27th year of his age, and in 1693, or 4, where he immediately determined to make the ſtudy of agriculture one of the chief amuſements of his life.

In purſuance of this reſolution, not only at the place, and in the neighbourhood where he lived, but in his journies, either to Dorſetſhire, where he had concerns, or to Leiceſterſhire, in viſits to his father-in-law, Sir Ambroſe Phillipps of Garenton, or to his own eſtates in Wiltſhire and the Iſle of Wight, and to other parts of the kingdom, he made it his buſineſs to ſearch out the moſt reputable farmers, and get the beſt informations he could, in all the branches of huſbandry that were known and practiſed in thoſe countries. His conſtant method was to note down the opinions and advices he thought might be uſeful to him, and afterwards to add occaſional remarks on them from his own experience. For many years, I believe, he had no other drift, in employing himſelf after this manner, than merely his own information and improvement; but about the year 1713, he ſeems to have entered into a deſign of making his obſervations public; for I find he had begun an index, and had thrown together ſome thoughts, as an eſſay towards an introduction, dated at that period. Though his other ſtudies however, which were chiefly in divinity, in which he has left a very long and laborious work; his frequent attendance on the buſineſs of his neighbours in the capacity of juſtice of the peace, and the care of a numerous family (for he had no leſs than twenty children, of whom ſeventeen ſurvived him) hindered him from purſuing this his intention, yet they did not interrupt his firſt deſign, but he continued writing down his inquiries and experiments to the time of his death, which happened in the year 1722.

As theſe obſervations therefore were left in ſuch diſorder, as to require no ſmall pains and application to regulate and digeſt them, and as all his ſons, except the eldeſt, were bred to profeſſions, and thoſe very foreign to that of agriculture, and had neither leiſure nor inclination for an undertaking of this nature, they would, in all probability, have been entirely ſuppreſſed, had not I accidentally communicated them to ſome farmers of my acquaintance, as likewiſe to ſome gentlemen, who amuſe themſelves in huſbandry, who were all of opinion they might be of uſe to the profeſſion, and encouraged me to collect them under their ſeveral heads, and put them into the order in which they are here publiſhed.

Some of his readers will ſmile, no doubt, to ſee the names of many of our Engliſh farmers mingled together with thoſe of the antient Romans, Varro, Cato, Pliny, Columella, and Palladius, and with thoſe alſo of our own writers, Lord Verulam, Evelyn, Ray, Grew, Boyle, and Mortimer; but, had I thrown them out, I muſt have given an entire new form to the whole, and when I had done all this, the reader, in my judgment, would have owed me no thanks for my pains: it would have robbed the work of an agreeable ſimplicity, and made it appear leſs genuine. I was inclined therefore to print it as I found it, and was pleaſed to find this inclination ſeconded by the advice of many of my friends.

For the ſtile, I think, I need make no apology; for what correctneſs can be expected in obſervations haſtily penned down, and thoſe oftentimes from the mouths of common farmers? In a book intended for the inſtruction of huſbandmen ornaments would be miſplaced: it is ſufficient if the language be intelligible; nor is it at all my wiſh, that the author ſhould be eſteemed a fine writer, but a uſeful obſerver.

The reader muſt not expect a compleat body of huſbandry in theſe papers. Some things are but ſlightly touched on, as hops and rye, and ſome others not mentioned at all, as hemp, flax, &c. and many uſeful obſervations might perhaps be added, even in thoſe matters that are treated on at large, and in which the author was moſt converſant; for ſuch is the extent and variety of the ſubject, that, according to his remark in the introduction, it is never to be exhauſted. Every day produces new inventions and improvements in agriculture, but perfection is unattainable; and, I believe, there is no farmer, of whatſoever induſtry, age, judgment, and experience, that is not often deceived, and that will not acknowledge himſelf deficient in many particulars relating to his profeſſion.

Nor is the knowledge of huſbandry to be acquired by reading without practice. Books may give valuable hints to thoſe who have judgment to make uſe of them, but, to learn the firſt rudiments of this art, it is neceſſary to ſerve an apprenticeſhip to it as to other trades. Many, and indeed the chief part, of theſe obſervations therefore are not calculated for the inſtruction of mere novices, but to aſſiſt thoſe, who are already practitioners; to ſhew them the opinions of others in doubtful and diſputed caſes, the rules laid down by the antient and modern writers, and the uſages of diſtant counties in this kingdom; to encourage them in making trials; to caution them againſt many errors, and oftentimes ſave them much labour and expence, by communicating experiments already made to their hands.

As Mr. Liſle however began his collection at a time when he was but young in the buſineſs, and that purely for his own information, there are ſome rules in it, without doubt, that experienced farmers will have no need of, and ſome perhaps that may be thought of too little importance to enter into a work of this kind; but however common and unneceſſary they appear to ſome, they may be new and uſeful to others. Whatever imperfections there are of this nature, I muſt ſubmit to take them on myſelf, and freely acknowledge, I know not how to ſeparate the chaff from the corn. I intreat the reader's favour therefore, that, whatever ſuch faults he finds, he would impute them to my ignorance in this art or ſcience, and not to the author, who died without reviſing, or putting his obſervations into any form, and who probably would have made them better worth the public view, had it pleaſed God to have continued the bleſſing of his life to his family.---Such as they are, they are all copied from his manuſcript, not ſcraped together from other books for the ſake of gain, and would never have ſeen the light, had I not thought they would be of benefit to my countrymen; and, that I may be the more readily believed, I aſſure them, except a few copies to preſent to my friends, I reap no kind of profit from the publication.

Burclere, Hants;
Sept. 1, 1756.

THOMAS LISLE.

THE
AUTHOR's
INTRODUCTION,
MDCCXIII.

IT may be looked on, in my opinion, as one of the chief misfortunes of this age, that we have not ſuch honourable conceptions of a country life, as might engage our gentlemen of the greateſt abilities in parts and learning, to live upon and direct the management of their eſtates. It is what I have in my moſt ſerious reflections often lamented, not only as a conſiderable diſadvantage to themſelves, but a great loſs to the public. Among the Greeks the knowledge and eſtimation of agriculture was at the greateſt height in their beſt times; among the Romans their ſenators ploughed; and the great examples they gave of virtue and induſtry laid the foundation of all their after-greatneſs; but as agriculture decreaſed in their eſteem, luxury took place, and ſoon put a period to their power.—I would recommend it to our Engliſh gentlemen to conſider how much this may be our caſe at preſent; to look round them, and ſee how many fine eſtates are daily mortgaged or ſold, and how many antient and noble families deſtroyed by this pernicious and almoſt epidemic turn to idleneſs and extravagance. The yeomanry of England, who in former times were the flower of our militia, and the boaſt of our nation, have always continued to be of great conſequence and uſe to us, and a very neceſſary link in the chain of government, as having an immediate connection with the gentleman on the one ſide, and the labourer on the other. Being diſtributed among the ſeveral pariſhes, and fitted for various offices, under the eccleſiaſtical and civil juriſdiction, as of church-wardens, overſeers, headboroughs, and the like, which will not hereafter be ſo worthily filled, they carried a reſpect with them, and were of eſpecial ſervice in keeping the meaner people to their duty; add too, that, being men of ſubſtance, they were of wonderful advantage to the neighbourhood they dwelt in, by employing the poor, by affording them comfort and aſſiſtance in their ſickneſs or misfortunes, in adviſing them in their family concerns, and in compoſing differences among them; and alſo to the commonwealth in general, in keeping up a ſpirit of liberty in the country without licentiouſneſs, in withſtanding corruption and oppreſſion, in maintaining the laws, and in aſſerting the priwilges of a free people. Theſe too however have caught the infection, and will be mimicking the manners of their betters: it is a melancholy truth, but I ſpeak it knowingly; I ſee old reputable families in my neighbourhood every day falling away to nothing, and may take upon me to propheſy, paſs but a few years, this race of veterans will be loſt in the kingdom. Nor can the gentry, with like management, be long able to ſurvive them; they muſt one way or other return to their original, the plough; if they will not do it by choice, and for their own advantage, they will hereafter be neceſſitated to do it for the advantage of others; for we ſeem to be forming ourſelves apace after the French model, here and there a great man, the reſt all vaſſals and ſlaves. As this threatens to be the caſe, I ſhould think it no ſmall happineſs, and myſelf no inconſiderable patriot, if I could contribute any thing towards raiſing the reputation of huſbandry among the gentlemen of this kingdom. It is an undertaking, I acknowledge, that affords but little proſpect of ſucceſs; for ſo far are we now from eſteeming it either honourable or gainful, that we will not ſuffer it to be ranked among the liberal arts, and that we look on it as the high road for a gentleman to be undone; nay, it is become ſo decried, and out of faſhion, that the writing on the ſubject ſeems to render me accountable for an apology. I am ſatisfied notwithſtanding, if gentlemen would uſe ſuch proper methods to attain a ſkill in this, as they muſt do to be maſters of any other art or ſcience, they would ſoon find an entertainment in it not unworthy the moſt exalted genius. It was the method of life that our Creator firſt deſigned us, and that to a farther end than our temporal good alone. Other worldly buſineſs carries our minds off from God, whereas in this we draw nearer to him, not only as the country life gives the greater opportunity vacare Deo, but as the buſineſs of huſbandry is of that nature, as muſt often raiſe in us good reflections, and turn our thoughts towards him. Every ſeaſon, and every change of weather in the ſeaſon, awakens in us the conſideration of his providence, and a more than common ſenſe of our dependence on his bleſſing, from the perpetual occaſions we have of obſerving and reflecting how he gives us our daily bread. A man cannot be buſied in the offices of huſbandry (they conſiſt of ſo great variety) but many things will come under his obſervation, from which divine, moral, and philoſophical concluſions are ſo natural and obvious, that, if he will avoid making them, he muſt ſhut his eyes againſt the light of the ſun. It is a great miſtake therefore in thoſe gentlemen, who conſider huſbandry as too narrow and mean a buſineſs for a perſon of parts and education to employ himſelf in. Can they propoſe a nobler entertainment for the mind of man than he would find in the inquiries he muſt make into all the powers and operations of nature wherein huſbandry is concerned? The ſubject is ſo vaſt it can never be exhauſted; could he live, and ſpend ages in agriculture, he might ſtill go on in his ſearches, and ſtill make freſh diſcoveries, that would excite afreſh his admiration of the riches of God's wiſdom. Add too, that ſcene of nature, which the country lays before us, has I know not what charms to calm a man's paſſions, and ſo to compoſe his mind, and fix his thoughts, that his ſoul ſeems to be got clear of the world; and the farther his education enables him to carry his inquiries, the higher are his reflections raiſed. In the fields methinks God is walking, and, it is to be hoped, when he finds man ſo virtuouſly employed, in the way of his own deſignation and appointment, he may be pleaſed ſo to viſit him with his grace, as to give more light and warmth to the good thoughts at that time in his mind, and to fix a deeper impreſſion of them on his heart.

If we conſider huſbandry in regard to our temporal good, provided it be carried on with induſtry and judgment, it is a ſure way to improve our fortunes, and indeed the only way the landed gentleman can take; it were to be wiſhed therefore they would exhort their children early, particularly their eldeſt ſons, to think of it with emulation, and to enter into it as a ſchool of profit and education; whereas it is rather looked on as a purgatory for the diſobedient, a ſcene of puniſhment, to which a ſon, who anſwers not his father's expectation, is to be abandoned; or a condition of life of which none would make choice, but ſuch whom fortune has not in other reſpects favoured. If the country-gentlemen therefore frequently conſiſt of perſons, who are either ruſticated by their parents in anger, or who, making a virtue of neceſſity, ſettle on their eſtates with averſion or indifference, it is no wonder the comedians exhibit them on our ſtage in ſo deſpicable and ridiculous a figure; but this is the fault of the perſons and not of the art. Were they properly initiated in the ſtudy of agriculture, and purſued it as they ought, it would be ſo far from excluding them from uſeful knowledge, and bringing them into contempt, that I may venture to aſſert, they would find it the beſt ſchool of education, and the fitteſt to prepare them for the ſervice of their country in the two houſes of parliament of Great Britain.

It is not only an employment, whereby the health and conſtitution is eſtabliſhed, which is very neceſſary for the attendance on, and the diſcharge of that great duty, but the buſineſs of huſbandry, if they will not miſpend their precious opportunities, brings them acquainted with the condition and myſtery of all ſorts of inland trades, inaſmuch as, for the moſt part, they depend on, and have relation to the plough, or produce of the land, and their intereſts are mutually interwoven with the huſbandman's; nor can a diſcouragement fall on huſbandry, either by bad ſeaſons, or an ill timed act of parliament, but the meaneſt artiſan, the merchant, and even the ſovereign on the throne muſt feel it. Thus we ſee it is a vaſt field of ſcience the huſbandman is exerciſed in, and undoubtedly it muſt be a very great advantage to him, and give him weight in either of thoſe aſſemblies, by furniſhing him with ſolid arguments, and enabling him to deliver his opinion clearly and confidently on what he thoroughly underſtands and knows. It is a general obſervation, that they ſpeak beſt, and are beſt heard, who are more of an active than bookiſh life; the infirmities of the latter leading them oftener to adorn themſelves than the ſubject, and to take a compaſs, to ſhew rather what they have read than what is only pertinent to the debate: men of buſineſs are conciſe in words, and choice in matter; men of ſmall experience and great reading voluminous in both kinds.

Again, it is ſurely no ſmall recommendation to huſbandry, that it is productive of long life and health. The nerves and all the ſolids of the farmers and labourers bodies are much ſtronger than thoſe of gentlemen, who live an idle and unactive life, their fluids much purer and unmixed; their bones conſolidate eaſily; their ſtrained ligatures return ſoon, and with ſmall help to their tones; their blood circulates better, and opens the channels of the veſſels in bruiſed places of its own accord, ſooner than in a gentleman by the aſſiſtance of oils and plaiſters; and ordinary medicines work more ſucceſsfully on their diſeaſes than the moſt ſovereign ſpecifics on perſons of higher quality. As they are leſs paſſive therefore in their conſtitutions, they often arrive at their fulneſs of years, which citizens, and gentlemen who are not exerciſed in country employments, ſeldom reach.

From what has been here obſerved of the ſtrength and athletic condition of the countryman's body, it is eaſy to conceive how a greater ſhare of health ſhould be his portion; and here I take upon me to affirm, that I have mademyſelf acquainted with the diſeaſes of the farmers and labourers in my neighbourhood, and have hardly found one who is ſubject to either gout, ſtone, or cholic, or indeed to any chronical diſtemper; nor do they lie under that common infirmity of the gentry, ariſing from ill habits of body

and

and mind, called vapours, which is ſuch a drawback from life, as to ballance it's value, and render it little preferable to death. Their ſenſes alſo ſeldom fail; but they enjoy a comfortable uſe of them throughout their old age. Their appetites to their food are much keener, and they receive much more nouriſhment from it than the idle part of mankind would do from the ſame in quality and quantity, or indeed from the richeſt ſoops and ſauces; for their bowels are faithful ſtewards of what they are entruſted with; they ſtrain it to the laſt drop, and fling away nothing to waſte. I have obſerved in their death-bed ſickneſs they have kept a ſound memory and underſtanding, within a few minutes of their laſt extremity; for their nerves, having not been vitiated in their tones by debauches, are ſtrong; and the juices of their bodies not being depraved by viſcid, grumous, and inflamed materials, the diſeaſed matter is not ſo fiery as to affect them with ſuch ſad delirious ſymptoms as the fevers of the gentry arecommonly attended with.

The huſbandman's death's blow is generally from a great cold, to catch which he probably took a method ſufficient to have killed the ſtrongeſt animal. For the moſt part I have found it proceeded from imprudence, in ſtanding ſtill without his cloaths, or drinking a great quantity of ſmall beer, when in a violent ſweat, by which the cold has ſtruck ſo deep as to coagulate the blood and juices, and deaden the tones of all the ſolids; ſo that the difficulty has been to ſet the wheels again in motion, and to open obſtructions by giving a ſpring and hurry to the blood. But even in this his laſt and dying ſtate, as I ſaid, his complaints are few, in compariſon to what I have ſeen thoſe of higher condition labour under; and his brain is not diſturbed like theirs in the common malignant caſes; and this is no ſmall advantage and comfort to our huſbandman, who is hereby enabled to ſettle thoſe worldly affairs he had before neglected, to recommend himſelf to the divine mercy, and, like a patriarch, to beſtow his dying bleſſing on his children. Before I leave this article, concerning health, let me in particular recommend the conſideration of it to men of letters. I make no great queſtion, if they would plough one day, that is, buſy themſelves as huſbandmen uſually do, and ſtudy the other, they would improve the ſtate of learning far beyond what they now do or can. My meaning is, they would probably live longer, enjoy much greater health, and more active ſpirits; whereas the ſtudious inquirers after knowledge, for the moſt part, bring early decay on themſelves, for want of free uſe of air and exerciſe, and relaxations of the mind; and, tho' moderate in other reſpects, yet, through the common irregularities incident to bookiſh people, by the time they arrive to a little more than the middle age of man, they are under complicated diſtempers, of an irreparable and broken conſtitution, and the remaining part of their lives is ſpent in nurſing their infirmities, and purſuing knowledge in a ſickly and ungrateful manner.

But, among all the advantages ariſing to a gentleman from the employments of a country life, the principal is that of doing good, of which no one, in a private ſtation, has greater opportunities. If he applies himſelf to the variety of country buſineſs as he ought, he will not only give bread to a great number of indigent and induſtrious people, but his actions alſo are on the ſtage; his light is not buried under a buſhel. The characters of thoſe who live in a great city, where they have few tranſactions with their neighbours in the ſame ſtreet, are loſt by their diſperſed dealings, at diſtant places, and among people unknown to each other; an excellent perſon therefore cannot in this ſituation be propoſed for a public example, to attract the veneration of his neighbourhood. His ſecret admirers are ſtrangers to one another, and to the inhabitants near him, and perhaps know but ſingle inſtances of ſuch a gentleman's worth; whereas it is the uniformity that gives the great luſtre to his actions, and renders them moſt amiable. With the gentleman, who is engaged in country affairs, it is far different. He muſt unavoidably concern himſelf with the families of the farmers and labourers round about him, and with the tradeſmen of the neighbouring towns and villages; and, if he be of ſhining virtues, I cannot conceive but he muſt be a great bleſſing to the pariſhes within the knowledge of him. By his frequent dealing with, and employing the inhabitants, he will of courſe have ſome cogniſance of their lives and converſations, and, having an opportunity of knowing them, may encourage them as they ſeem beſt to deſerve from God and man. They too, in their turn, even the loweſt labourers, from frequent and intimate views, will conceive a noble idea of their maſter, which will be heightened by their concurrent teſtimony when they meet together: by his actions and ſentiments they will quadrate their own; and, if he be of a piece, and uniform through all the parts of a good and prudent life, he is miſtaken much, if he thinks the benefit of his virtues confined to himſelf only: he is obſerved and imitated by this ordinary ſort of people, and it is they too, for the chief part, that will fix the character he muſt bear. The diſcourſe on their maſter is the ſauce to their bread and cheeſe, when two or three at breakfaſt or dinner-time ſit under a hedge; nay, their work by the taſk alſo ſhall loiter, but ſome remark they will make on the conduct of one gentleman or other; and we cannot be ignorant that every perſon of this ſtation in the country has acted a part, either good or bad, ſufficient to occaſion a general talk in the neighbourhood; his ſpeech and behaviour in all his dealings are reported again, tho' but one witneſs preſent, and how juſt or how diſagreeable his ſentiments or actions were in any caſe that happened is canvaſs'd amongſt them, and judgment is paſſed on his wiſdom, virtue, and religion; and the labourer's wife muſt hear the tale over again when the huſband comes home. In a word, there is no action ſo minute in a gentleman but it is worth the gazing on; and, tho' it be of a nature indifferent, yet the manner of doing it may carry an unaffected beauty and grace with it, which if it does, be aſſured, theſe country people will ſee a great way into it, and ſecretly revere the perſon according to his merits. Nor is this all, for the reſpect they bear him ſhall influence their thoughts, cruſh their evil imaginations, leſt he, if they proceed to action, ſhould have the knowledge of it; ſo that a country gentleman, eſpecially if in commiſſion of the peace, ſhall, in this ſtation, do a world of more good in preventing evil by his example, than by puniſhing it. If, in the courſe of country buſineſs, he determines differences without humour and peeviſhneſs, ſhews a diſpleaſure without anger or ſwearing, ſets a mark of diſtinction according to juſtice and equity, the common people are ſenſible enough of the right judgment: he ſows wiſdom and goodneſs in their hearts, and the increaſe may certainly be expected amongſt them.

I have but one word more to add to the advantages of huſbandry already enumerated, which is, that of all profeſſions there is none more innocent or more pleaſant. The buſineſs of it goes on, in a known and certain courſe, from ſeaſon to ſeaſon, from year to year; the gains from it are moſt ſatiſfactory to a ſcrupulous conſcience, becauſe our goods are ſold in an open market, are ſet up together with thoſe of our neighbours, and of the ſame kind and ſpecies, whereby the ignorant may make the better compariſon of their worth; we do not grow rich by jobbing, or by buying and ſelling again, the profit of which too often conſiſts in outwitting and preying on one another; but our advantages ariſe from the gifts of our beneficent mother, the earth, whoſe gratitude generally requites the tiller's care, and by whoſe increaſe we hurt nobody; our dependence, next to God's bleſſing, is on our own induſtry and ſkill, and, tho' the ſeaſon diſappoints us ſometimes, yet that diſappointment is neither ſo often, ſo great, nor ſo fatal as the diſappointments of thoſe in other profeſſions, whoſe truſt and dependence is more on man. What miſerable calamities fall out from the neceſſary truſt in trade one citizen muſt give to another, and to his cuſtomers, whereas the farmer ſells for ready money: he may thrive alſo without ſupplanting his brother, which the courtier can rarely do.—Certainly that perſon muſt live a pleaſant life, whoſe death every one deſires to die; and there are very few, of any art or employ, but who propoſe to themſelves, if they are able, a country retirement, with at leaſt ſome little of huſbandry, in the laſt ſtage of their lives. If ſo, tho' other occupations may be in themſelves innocent, yet this almoſt univerſal deſire in men to quit them before they die, looks as if they found it difficult to diſcharge their conſciences in them: they muſt be ſenſible, they can make no great figure as huſbandmen, but there is ſome delight even in negative virtue, in being awake, and doing no ill.

To conclude; as I have had ſome taſte and reliſh of theſe pleaſures, I am deſirous to propagate the ſenſe of them as univerſally as I can, and it would greatly add to my own ſatisfaction to have partakers with me in the enjoyment of it.

OBSER-

OBSERVATIONS

IN

HUSBANDRY.

ARABLE LAND.

Of the quality of land, and how to judge of it.

§. 1. PALLADIUS has laid down the following rule, by which we may make a judgment of the good or bad quality of land [a]. Dig a ditch, or hole in the ground; and if, on caſting in the earth again, there is too much to be contained in the place it came from, this ſhews it to be a rich ſoil; if the hole would have taken a greater quantity, it is a mark of a poor ſoil; but, if it juſt holds it, the ſoil is of a midling quality.

It is an indication of a good ſoil, ſays Pliny, if the crows and other birds flock eagerly to the new-turned-up earth, and follow cloſe on the ploughman's heels [b]. I doubt not indeed but the ſorts of beetles, which lay their maggots in the ground in autumn, and are to be produced in ſpring, (ſuch as the rook-worms) are ſo wiſe as to lay them in rich ground, that they may

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[a] Pinguem terram ſic agnoſcis, ſcrobe effoſsâ et repletâ ſi ſuperaverit terra, pinguis eſt; ſi defuerit, exilis; ſi convenerit æquata, mediocris eſt. Pallad. fol. 51.

[b] Eſt indicatio bonæ terræ, ſi recentem exquirunt improbæ alites vomerem comitantes, corvique aratoris veſtigia ipſa rodentes. Plin. lib. 17. ch. 5.

be the better nouriſhed, as other inſects do alſo chooſe the tendereſt plants to lay their brood on. Worm-earths alſo abound moſt in the richeſt land.

If you obſerve any ground to bear a light crop of corn, and at the ſame time to be graſſy, it is to be preſumed the ground, thus running to, and bearing graſs, would have born corn alſo, if it had been well managed, and that ſuch ground is in good heart; but, if ground bears little corn, and no graſs, it is very ſuſpicious that ſuch ground is poor.

Mr. Evelyn obſerves, there are diverſe indications, by which we may know good mold or earth, as, among others, an infallible one is its diſpoſition to melt, and crumble into ſmall morſels, not turn to mud and mortar upon the deſcent of gentle ſhowers, how hard ſoever it ſeemed before, and if in ſtirring it riſe rather in granules than maſſy clods. As the kind of it's natural plant is, ſays he, you may prognoſticate for what tillage, layer, or other uſe the ground is proper: thyme, ſtrawberries, and betony direct to wood; and Sir Francis Bacon takes notice, as have others alſo, that camomile (I ſuppoſe he means mayweed) ſhews a land is diſpoſed to corn, burnet to paſture, mallows to roots; but moſs, ruſhes, wild tanſy, ſedge, flags, fern, yarrow, and where plants appear withered and blaſted, ſhrubby and curled, (which are the effects of immoderate wet, heat, and cold interchangeably) theſe are natural auguries of a curſed ſoil.—When there is any vein of ground that breaks up iron mold, no corn will grow there.

§. 2. [c] The ancient writers agree, that a deep and moiſt ſoil, and Palladius adds a chalky alſo, is moſt ſuitable to wheat, and a light dry ſoil to barley, which will be killed, they ſay, if ſown in wet muddy ground; (and ſo indeed barley might very well be in their countries, where it was ſowed in November) that wet ground agrees beſt with peas and beans, which, if committed to a dry ſoil, will periſh in the earth, or, if they are not abſolutely killed, will come up in a ſickly ſtarved condition; that the reſt of the leguminous kind will bear a dry ſoil, but thrive moſt in a wet one: of all theſe however I ſhall treat under their ſeveral diſtinct heads.

Of loam. §. 3. Mr. Evelyn does not reckon loam among the clays, though it ſeems to be but a ſucculent kind of argilla, imparting a natural ligament to the earth, where you mix it, eſpecially the more friable, and is therefore of all other the moſt excellent mean between extremes; faſtening and uniting that which is too looſe and ſtony, cooling that which is hot, and gently entertaining the moiſture.

Of ſtrong clay lands. §. 4. I ſee plainly by the temper of a field this year (1706) (ſown with barley on wheaten fallows) which is mixt land, and alſo by the temper of my clay-lands, [ſown after a whole fortnight of dry and hot weather, at the latter end of March, and three weeks cold drying windy weather following in April] that lands of the vales of England, or ſtrong clay-lands, ſuch as they are forced to ridge round, cannot but be moiſt enough to bring up the corn, even in the drieſt ſummers.

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[c] Spiſſa, et cretoſa, et humida terra bene far et triticum nutrit, hordeum agro ſoluto delectatur, et ſicco; nam in lutoſo ſparſum moritur. Pallad. lib. 1. fol. 53. Hordeum in terra non humida ſed valde arida potius ſerere oportet, frumentum verò in lutoſa et humida terra ſeminandum eſt; in tali enim magis augeſcit: fabus autem et piſum in lutoſa ſerere convenit; in arida enim conciduntur priuſquam enaſcuntur, et pereunt; quæ verò non conciduntur degeneres fiunt: reliqua legumina ſuſtinent quidem in arida terra ſationem, verùm meliora etiam ipſa fiunt et generoſiora in irrigua ſeminata. Leontius in Geoponicis, fol. 43.

Id. and of taming them.

At Oxford (anno 1708) in diſcourſe with Mr. Bobart about the beſt methods to tame harſh, churliſh, obſtinate clay, he ſaid, by experience he had found the beſt way was to fling it up in ridges in the winter, and after the firſt froſt, when it thaws and molders, to fling and temper amongſt it aſhes or chalk, or whatſoever you have to qualify it; for the time being nickt, wherein you can catch the claiy corpuſcles under the greateſt diſunion and ſeparation, is the time for keeping them ſo, by mixing theſe other lighter bodies amongſt them, which will the longeſt prevent them from their reunion: this I think to be good advice.

To prevent land from baking.

§. 5. If ſome ſorts of ſtiff and binding land be ſown dry, and a ſharp ſcudd of rain falls before the earth has time to ſettle, it is obſerved that the cruſt of ſuch land will bake, ſo that the corn cannot come through, to the great damage of a crop; this evil happens not, if after ſuch a ſcudd of rain cool cloudy weather enſue, and not hot ſun-ſhiny; for then the earth will not lie ſo hollow as to be baked. The beſt way I think to prevent this, when one has ſuch land to deal with, is, to roll it immediately after ſowing, which faſtens the earth together, whereby the ſun has not that power of piercing into it, and conſequently not of baking it.

What grain to ſow on baking or binding land.

§. 6. I have a field that is very apt to bind, if rain comes on ſoon after it is ſowed with ſpring-corn, and a hot gloom on it, ſo that the corn cannot come through; therefore I adviſe that ſuch ground, a ſtiff clay, be ſowed, as often as conveniently may be, with winter-corn, ſuch as wheat and vetches; for though wet comes then, the ſun is not ſtrong enough at that time of the year to ſcorch the ground up and to bind it; and it is obſerved that this ground has been always lucky for vetches, which I ſuppoſe is for the reaſon above.

Of white land.

§. 7. "A land that eateth up the inhabitants thereof," Numb. xiii. 32. may very properly be applied to ſome of our chalky hill-country-land, which, in return for ploughing and all charges, brings the farmer out of pocket.

Some of my neighbouring farmers coming to ſee me, one of them aſked me if I intended to ſow a certain field with wheat this year (1707); I ſaid, Yes. He replied, he thought it would not bear twice ploughing, being white land, and having lain ſtill but two ſummers; and, ſaid he, for one earth it had better lie ſtill three years. I aſked him why; he ſeemed to be at a loſs about a reaſon; I told him, I thought the reaſon of what he ſaid depended on the firmneſs and fatneſs of the ground; for, ſaid I, if white land that is lay, is looſe at top, and not very cloſe and well ſettled, then it is too early to ſow it on one earth, becauſe the bottom that is turned down will be looſe, and the bottom with the harrows will be looſe, and conſequently will not hold rain well enough, but it will run through too ſoon. Said he, You ſay well; but my reaſon is, becauſe this field is apt to have redweed; and if ſuch land with us is ploughed up under three years, and ſowed to one earth, we obſerve it runs much to weed. If that holds, ſaid I, the reaſon muſt be, becauſe the ſeed of the redweed being turned under the earth, where there is not a faſtneſs it grows through, whereas, where the land is faſt, it is choak'd; but this field ſeeming to me a faſt and well ſettled white ground, the reaſon will not hold in either caſe.

Note, it is common with farmers to ſay, that generally their whitiſh land, unleſs a very barren mortar-earth, produces as good wheat and barley, and fuller bodied, than their clay-land and ſtronger earth: but I doubt the reaſon of it is, becauſe the lighter whiter earth needs not more tillage than they give it, and is not much damaged with unſeaſonable ploughing; whereas the clay-land is ſeldom ploughed enough by them, and that often unſeaſonably, by which it much ſuffers.

Of black, ſpungy land.

§. 8. About the middle of a field near me, there runs a vein of black, coary, ſpungy, and yet dry earth, of the colour of Bagſhot-heath, only dry; in this land the farmer never had good corn in his life-time, but here and there a tuft; therefore he never more ſows it. In Woodcot-down there is ſuch a piece of land abutting to this field; the farmer burn-bak'd it, notwithſtanding I told him he would have no corn; and he had none.——Note, In theſe ſort of grounds the rook-worms are bred; and where rook-worms breed argues a rotten looſe earth, but not always fit for corn, notwithſtanding my former remark on the ſagacity of thoſe inſects; this black land to many ſtrangers would promiſe more than any other land on the farm.

Of red, ſandy land.

§. 9. A red, ſandy, ferny ground, not worth twelve pence per acre, ſhould be managed thus: the ſword of the ground is not to be killed under two or three crops, if you winter fallow for ſummer corn; and ſuch ground will be ſo beggar'd as to bring but pitiful graſſes after two or three crops, which crops alſo are likely to be very mean; therefore I propoſe that ſuch ground ſhould be midſummer fallowed to rot the roots of the graſs, and ſtirr'd in the winter, and ploughed and ſowed with black oats and rye-graſs early in the ſpring, and ſowed very thick, ſo as to bind the ground by ſuch means; this ground will be in good heart to bear the rye-graſs, and hold it a year or two, or longer; then this ground is to be ploughed up, and managed again in the ſame manner; for ſuch ground will pay beſt to be laid down to graſs.

Of land ſubject to blights.

§. 10. Some of my grounds are ſubject to blight, for which reaſon I would never plough ſuch a ground to white oats or barley, though never ſo good; for barley and white oats muſt be ſown later than other corn, and conſequently will not have ſo much time to be ſettled in the ground, for which reaſon ſuch a ground will be more ſubject to blight; black oats therefore, and wheat, I hold the propereſt grains for ſuch ground, and do believe in ſuch ground the black oats ſhould be drag'd in.

I ſowed barley the ſecond and third days of May, anno 1703; I had a great burthen of rath-ripe barley, but thin and blighted for the moſt part;

for indeed clay-land is ſo ſlow in forwarding corn, eſpecially if it lies to the north, and has a hedge-row to the ſouth to ſhade it, and a wet ſummer to boot, as there was this year, that 'tis not to be expected it can carry a full bodied corn; therefore ſuch ground ought to be ſowed earlier. I obſerved on the north ſide of the hedge-row, where the head-land was, the corn ſeemed riper than any in the field, but very thin of flower, which I take to be becauſe it had ſo little ſun, that nature could not carry it on to it's perfection, conſequently, having done it's utmoſt, the corn ſoon withered and grew dry.

Our white land at Crux Eaſton, though poor, is ſaid to bear the beſt bodied corn, which I am ſatisfied, according to the common way of management, it does in wet or dripping ſummers; but if the ſummer proves very dry, as this year (1704) was, I find the barley, eſpecially before it begins to ripen, ſhrinks and runs to a brown colour, and blights, the ground not being able to nouriſh it any longer; when the clay-land ſhall better ſupport it's barley, and produce a fuller and finer rin'd grain: the leaves on trees in white land in ſuch years ſhall ſoon decay and turn yellow.

The reaſon why thoſe grounds which hang from the horizon to the eaſt are moſt ſubject to mildew, and to blaſting, may be (as I judge) from the ſun drawing theſe vapours towards it, juſt as a great fire in a room draws the air towards it; ſo the ſun having ſet theſe in motion, but not having ſtrength enough to draw them into the middle region, to form them into a cloud, doth yet draw them till he is below our horizon; then theſe dews tend to the earth from whence they were taken, and in their motion to the weſt do fall on that ground which hangs eaſtward, at right angles; therefore offenſive to them moſt. Cook, fo. 8.—This ſeems to hold in corn land alſo.

§. 11. The ſide-lands in the hill country are always the pooreſt, becauſe the good grete, or mold, is waſhed down by rain. Of ſide-lands.

I was obſerving the great difference between the lower head-land of my wheat and the other parts, the head-land being much the beſt wheat: this muſt be occaſioned by the horſes much treading on the turns, whereby the head-land was laid ſo cloſe, that it kept in the moiſture better than the lighter parts, which ſoon burnt up. Of head-lands.

I obſerve the head-lands of all corn are firſt out in ear, not only on account of their being generally better in heart, but becauſe, lying under the hedge, the corn lies warmer.

§. 12. Light land is ſaid to be the beſt and kindlieſt land for corn, whilſt it will hold it, and that may be for three years; but ſtrong clay-land, though it will bring the leſs crops, will hold it longeſt, and endure ploughing poſſibly for ſix or ſeven years. Of light moldering land.

We have in the hill-country of Hampſhire a light moldering ground, eſpecially on the ſide-lands, which the countrymen think not fit to plough up for a wheaten crop till it has laid ſtill five or ſix years, and got a ſword, but will then plough it to a barley and wheaten crop: the very life of theſe grounds, when ſowed, conſiſts in holding the ſeed faſt together, which girt it cannot have, being moldering, without a ſword; therefore they are out who will ſow it beyond a wheaten crop (which is ſowed on one earth) the ground after a wheaten crop being too looſe; I hold it beſt therefore to lay it down upon the wheaten crop, ſowing rye-graſs with it, which will not only grow up with the wheat, and keep the top of the ground firm againſt moldering in ſummer and winter, but by the ſtrength of the fold on the wheat will give good burthens of graſs till to be ploughed to wheat again.—The beſt huſbandry for all light barren ground ſeems to be, to ſow it to rye-graſs, and ſo to plough it up to corn once in four or five years, and ſow it again on the firſt crop to rye-graſs. Such ground is to be valued only on account of it's graſs, but, if ſowed to hop-clover, it will not at every two years end be ſtrong enough to carry corn.

Situation of a farm.

§. 13. [d] Cato, in the ſituation of a farm, adviſes his countrymen to chooſe a ſouthern aſpect; of ſo great conſequence was the nearer neighbourhood of the ſun even in thoſe hot countries, and therefore not to be deſpiſed in theſe colder; for it is plain to me, that the corpuſcular bodies of the ſun injected not only into our bodies, but into all vegetables by it's heat, are in their influences prodigiouſly more powerful towards fructifying all ſorts of plants, than any other manner of heat, or other rich manures whatſoever; for ſoot, nitre, aſhes, blood, artificial ſalts, or other mangoniſms and compoſitions Glauber has made, though they may perform wonders in our cold countries, yet cannot produce above a fifth part of the increaſe the earth ſhall do, without theſe arts, in thoſe countries nearer the ſun, as Africa, and the Weſt-Indies. And the heat of the ſun is, I doubt not, ſo corporeal a body, as to have fixed in the earth of thoſe countries it's minuteſt particles ſo far, that, if we were to bring from thence a buſhel or two of their earth, it would for ſome time do wonders in our cold country, till the treaſures, the ſun had by it's activity injected, were exhauſted; and according to the above notion is the great benefit of ſummer fallowing to be accounted for: the often turning the earth in the ſummer grinds it into ſmall mellow parts, each of which receives thoſe ſubtle luminous emanations of the ſun in a more abundant manner, when it s parts are ſo looſened by the plough and ſpade. And I doubt not but in the hot climes, in their rainy or wintry ſeaſons, by reaſon of the richneſs of the ſoil, made ſo by the corpuſcles of the ſun ſo plentifully injected, that the trees ſtrike roots much deeper than with us, and that corn does ſo alſo, though poſſibly the ſtraw may not exceed the length of ours, becauſe the ſun checks it's growth, and confirms the fibres and ſtalks of the leaves too faſt.

A field of mine has a hedge-row to the ſouth-weſt, on a riſing ground: this hedge-row keeps off the ſun from it a great part of the day; it is a very good clay piece of land, through which the whole flock of ſheep paſs as often as they move from one ground to the other; the corn here runs much into halm, to ſhew the land is good, but produces a very thin grain: and the ſame proportion does a farm hold with this land, which lies ſhelving from the ſun to the north; for the ſame reaſon all head-lands fenced from the ſun muſt be treated accordingly, and ſweetened, not with dung, but chalk, aſhes, &c. and ſuch land is to be concluded always ſour: for the ſame reaſon ſuch lands are eaſily over-ploughed.

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[d] Cato ſcripſit, optimum agrum eſſe, qui ſub radice montis ſitus ſit, et ſpectet ad meridianam cœli partem. Varro, fol. 31. —— Inmeridiem ſpectet. Cato, f. 1.

I have in the former obſervation taken notice of the ſun's checking the growth of ſtraw, and confirming the fibres and leaves too faſt, which is the reaſon I have aſſigned, why the ſtraw may not in hot countries exceed the length of ours: this however may perhaps be no hindrance to the increaſe of the grain; for from what I have remarked of this field, and alſo from other obſervations, I am inclined to think Dr. Woodward's hypotheſis not improbable.—The vegetative particles of the earth, which are particularly adapted for nouriſhing the ſeed of a plant, may poſſibly conſiſt of a much more ſubtilized body than the other particles of earth, that nouriſh the ſtraw, leaves, &c; and this body may require longer time to be ſo rarified, concocted, and digeſted, probably by the ſun and air working on it, that by ſuch means it may be aſſimilated; for dung laid on very barren ground does not, by experience, conſiſt of abundance of theſe refined particles, and may therefore produce abundance of ſtraw, in our cold climate, but not of corn. —If this be the caſe, it ſeems probable alſo, that in every plant, among the innumerable tubes, which paſs thro' the ſtalk (ſuppoſing of wheat) to the ear, ſome peculiar tubes or fibres may be appointed by the All-wiſe Creator, which run from the root upwards to the ſummit, and are much finer and ſtraiter than the other tubes of the plant, for receiving and conveying to the ſeed the ſimilar and ſeminal parts and juices; conſequently, where earth does not abound in theſe parts, poverty ariſeth in the increaſe, tho' the earth may abound in the more groſs vegetative parts, allotted for nouriſhing the ſtalk. From hence it may be, that after one crop of peas you may have the next crop of peas full in halm or ſtraw, but never in kids; from hence we find, that often ſtirring the earth, ſubtilizing it's parts, and turning it up to the air and ſun, is exceedingly conducive to the multiplying of grain, though the length of ſtraw may not be much increaſed by it: this may probably give a reaſon why aſhes, ſoot, &c. may have ſuch copious vegetative particles in them, as to force ſo ſtrongly the growth of plants; for the fire having ſeparated and looſed the heterogeneous parts, which clogged each other, the vegetative particles are thereby enabled to be more active, and, being reduced into their minuter corpuſcles, do aſcend in greater numbers up the tubes of plants. Nor is it to be objected, that by fire theſe vegetative particles ſhould be deſtroyed, ſeeing they are ſuppoſed to be ſolids. The proper alimental juices being thus prepared by nature, and the different tubes being fitted to receive them, vegetation appears to be performed in plants no otherwiſe than by the riſing of juices up the tubes by the heat of the ſun, in the ſame order and manner as the diſſimilar juices and ſpirits riſe in an alembic; the orifices of the tubes, conducting either to the ſtraw or ſeed, being fitted to receive the juices appropriated to either [e]. This order is however ſometimes interrupted, by reaſon that the atoms of heterogeneous juices will ſometimes ſhoot themſelves up in different angular ſtirias from what are adapted to the orifices of the tubes; whereas in an alembic, where the paſſage of riſing is free, the apothecary can call for the order he knows his ſpirits will riſe in.—What theſe alimental juices conſiſt of, it is not eaſy to ſay: Sir John Floyer, in his Touch-

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Of change of ſpecies.

[e] The common opinion, maintained by Mr. Evelyn and others, is, that every plant exhauſts it's own proper nutriment, leaving that which is appropriated to the other plants quiet and undiſturbed. Dr. Woodward not only ſubſcribes to this notion, but adds, That there are very many and different ingredients to go to the compoſition of the ſame individual plant; of which ingredients every part of the plant has one allotted to it for it's ſeparate and peculiar uſe. Our author, though he aſſerts nothing, yet, in this ſuppoſition, that the ſtraw and ſeed may be nouriſhed by different kinds of juices, received at different orifices, and conveyed from the root upwards by different tubes, ſeems not to diſſent from Dr. Woodward's opinion. The doctor reaſons from the vaſt variety of taſtes, ſmells, colours, forms, and ſolidneſs, that it is impoſſible one homogeneous matter of the ſame ſubſtance, conſtitution, magnitude, figure, and gravity, ſhould make up all this variety; and concludes, that there want not good indications, that every kind of vegetable requires a peculiar and ſpecific matter for it's formation and nouriſhment; Yea, ſaith he, each part of the ſame vegetable doth ſo. The former part of this concluſion is aſſigned by the doctor as the cauſe of the neceſſity of frequently changing the ſpecies of vegetables. But Mr. Tull, in his 14th chapter of Horſe-hoeing huſbandry, treats the doctor's arguments with great contempt, and in contradiction to them advances the three following propoſitions,

1. *That plants of the moſt different nature feed on the ſame ſort of food*;
2. *That there is no plant but what muſt rob any other plant within it's reach*;
3. *That a ſoil which is proper for one ſort of vegetables once, is,* IN RESPECT TO THE SORT OF FOOD IT GIVES, *proper to it always*;

And concludes, that if any one of the propoſitions are true, there is no need to change the ſpecies of vegetables from one year to another, IN RESPECT TO THE DIFFERENT FOOD THE SAME SOIL IS, THOUGH FALSLY, SUPPOSED TO YIELD.

In ſupport of theſe propoſitions he argues, that, if in this ſeries of crops each ſort were ſo juſt as to take only ſuch particles as are particularly proper to it, letting all the reſt alone to the other ſorts to which they belonged, then it would be equal to them all which of the ſorts were ſown firſt or laſt. But let the wheat be ſown after the barley, peas, and oats, inſtead of being ſown before them, and then it would evidently appear, by the ſtarved crop of wheat, either that ſome or all of thoſe other grains had violated this natural probity, or elſe that nature has given to vegetables no ſuch law of meum and tuum. Again, if all plants did not feed on the ſame ſort of food, they could not rob one another, as they are allowed to do; a charlock could not rob a turnip, and ſtarve it more than ſeveral turnips can do, unleſs the charlock did take from it the ſame particles which would nouriſh a turnip, and unleſs the charlock did devour a greater quantity of that nouriſhment than ſeveral turnips could take. Flax, oats, and poppy could not burn or waſte the ſoil, and make it leſs able to produce ſucceeding crops of different ſpecies, unleſs they did exhauſt the ſame particles which would have nouriſhed plants of different ſpecies; for, let the quantity of particles theſe burners take be never ſo great, the following crops would not miſs them, or ſuffer any damage by the want or loſs of them, were they not the ſame particles, which would have nouriſhed thoſe crops, if the burners had left them behind, quiet and undiſturbed. Neither could weeds be any prejudice to corn, if they did draw off thoſe particles only that ſuit the bodies of weeds; but conſtant experience ſhews, that all ſorts of weeds, more or leſs, diminiſh the crop of corn. Theſe are his principal arguments, and as a confirmation of the fact, that plants of the moſt different nature feed on the ſame ſort of food, he produces this experiment. At the proper ſeaſon, tap a birch-tree in the body or boughs, and you may have thence a large quantity of clear liquor, very little altered from water; and you may ſee, that every other ſpecies of plants, that will grow in water, will receive this, live and grow in it as well as in common water. Having thus given his objections to Dr. Woodward's hypotheſis, concerning the cauſe of the neceſſity of frequently changing the ſpecies of plants, he proceeds to propoſe his

Touchſtone of Medicines, is of opinion, that plants only ſpread their roots in the common earth, but draw their nutriment from the rain water, impregnated with the ſulphureous acid of the air; but Dr. Woodward by many experiments has confuted this, and the like opinions delivered by other authors, and ſufficiently proved, that the watery part imbibed, and running up the tubes, is only the vehicle to a certain vegetable terreſtrial matter, which gives nouriſhment and increaſe to plants. Theſe minute, atomical, imperceptible bodies ariſe up thro' theſe watery tubes with wonderful ſwiftneſs, according to the rules of levity and gravity, by how much their atomical parts are lighter than the water, or have a figure ſerviceable to that ſpeed; and the water thruſting ſtill forwards at the extremity, theſe minute parts are forced to the ſide of the tube or pipe, and every minute part helps to the increaſing and lengthening it.

his own. One true cauſe of a crop's failing, ſaith he, is want of a quantity of food to maintain the quantity of vegetables which the food ſhould nouriſh. When the quantity of food is ſufficient for another ſpecies (that requires leſs) but not for that which laſt grew, to grow again the next year, then that other is beneficial to be planted after it; for the conſtitution of plants are different; ſome require more food than others, and ſome are of a ſtronger make, and better able to penetrate the earth, and forage for themſelves. Therefore oats may ſucceed a crop of wheat on ſtrong land, with once ploughing, when barley will not, becauſe barley is not ſo well able to penetrate, as oats, or beans, or peas are. Long tap-rooted plants will not ſucceed immediately after thoſe of their own or any other ſpecies of long tap-roots, ſo well as after horizontal-rooted plants; but horizontal will ſucceed thoſe tap-roots as well or better than they will ſucceed horizontal; for the food at a greater depth has already been exhauſted by the one, and chiefly that which lies nearer the ſurface by the other. The reader muſt obſerve here, that theſe cauſes, to which Mr. Tull imputes the neceſſity of changing the ſpecies of plants, are cauſes only in the common way of huſbandry; for by his new method of conſtant tillage, he tells us, he prevents their effects. For example, wheat is not, in the common way, (eſpecially on any ſtrong ſoil) to be ſown immediately after wheat; for the firſt wheat ſtanding almoſt a year on the ground, by which the ground muſt grow harder, and wheat ſeed-time being ſoon after harveſt in England, there is not ſpace of time to till the land, after having been thus exhauſted, ſo much as a ſecond crop of wheat requires; but wheat, in his new method, may be ſown immediately after wheat; for by keeping the ground in conſtant tillage he procures a ſufficient quantity of food for his plants, and ſtrengthens their conſtitutions: if ground therefore be managed according to the rules preſcribed in his book, he aſſerts, there is no neceſſity of ever changing the ſpecies. I think it may be objected to this aſſertion of Mr. Tull's, that it is not only the farmer but the gardener alſo who complains, that his ground is grown tired of ſuch and ſuch a plant; and finds himſelf under a neceſſity of changing it for another ſpecies; and yet in his hands the hough and the ſpade are in conſtant uſe, and he is perpetually manuring, turning, and pulverizing his ground; and, if what Mr. Liſle has taken notice of be fact, that after one crop of peas you may have the next crop of peas full in halm or ſtraw, but never in kids, it ſeems to follow that the ſeed and the ſtraw require different juices for their nouriſhment. See article Peas, title, Land ſowed to peas will not bear peas well again for ſix years. §. 12. alſo §. 11. Upon the whole however, which of theſe two gentlemen is in the right, or whether either of them is ſo, I muſt leave to the determination of thoſe who have buſied themſelves in theſe inquiries.

☞ Of the order in which the ſpecies ſhould be changed, ſee the author's remarks at the end of the article Sowing.

MANURE and MANURING.

Mr. Evelyn's catalogue of manures. Of nitrous ſalts.

§. 1. MR. Evelyn has given us an account of the various manures, either experienced by himſelf, or in uſe in his time, or of which he had conceived a good opinion; of theſe I ſhall preſent the reader with the following abſtract. Amongſt his compoſts, he ſays, cold and dry winters, with ſtore of ſnow, is one which I reckon equal to the richeſt manures, being impregnated, as they are, with celeſtial nitre. fo. 312.

'Tis ſalts, which entice roots to affect the upper, and ſaline ſurface of the earth, upon which the nitrous rains and dews deſcend, and are the cauſe that ſome plants the moſt racy, and more charged with juice than any other, ſuch as the vine, thrive ſo well amongſt rocks and pumices, and in whatever maintains this vital pickle. fo. 312.

'Tis ſalt which makes all cover'd and long ſhaded earths abound in fertility, ib. — Obſerve therefore, how under corn and hay-reeks corn grows; but yet it ſeems in meads, graſs comes not up well under hay-reeks, becauſe poſſibly the ground may be too rich, or ſalt, for perennial graſs, tho' not for annual corn.

Salt ſown in gravel-walks (as I have experienced it) for a time burns the earth, ſo that nothing will grow upon it; but when the rains have once diluted it, it ſprings up more wantonly than ever; for which I have left it off. fo. 314.

He has a wonderful opinion of nitre. fo. 315. — But, for ought I find, he is ſtrangely confounded about the principles of vegetation, what they are.

Woad and hemp.

§. 2. Woad and hemp are ſaid to deſtroy the vegetable virtue where they grow. fo. 316.

Human dung.

§. 3. He is againſt the uſe of human dung, unleſs it be well ventilated and aired, notwithſtanding Columella. fo. 317.

Dung of water fowl.

§. 4. Aquatick fowls dung is too fiery, and therefore not to be laid on ground, till the volatile ſalts have their mordicant and piercing ſpirits qualified. ib.

Manures for different ſoils. Gravel.

§. 5. If gravel be wet and cold, lime is preferable. fo. 304.

Sand.

§. 6. Arenous and ſandy earths want ligature; and beſides, conſiſting of ſharp and aſperous angles, wound and gall, curl and dwarf our plants, without extraordinary help to render the paſſages more ſlippery and eaſy; therefore relenting chalks, with calcinations of turf, are profitable. fo. 305.

§. 7. Sand, being of an open and looſe contexture, is apt to put forth a forward ſpring, as more eaſily admitting the ſolar rays, but it does not continue; this is an infirmity which may be remedied with loam, which unites it cloſer. ib.

Cold clay.

§. 8. With a hungry, or weeping, or cold ſort of clay, lime is not to be mixt, which being ſlack'd is raw and cold. fo. 307.—To theſe laxatives are beſt, ſuch as drift ſand, ſmall gritty gravel, ſaw-duſt with marl, or chalk, and continual turning it with the ſpade and plough. fo. 307.

Chalk is healing, and therefore proper for clay, cold, and ſpewing grounds.

Pond mud.

§. 9. Scouring of pond, or ditch-earth, is a moſt excellent manure for light land. fo. 309.

Swine's-dung.

§. 10. Lands that are hot and burning allay with ſwine's-dung, or neats-dung. fo. 309.

Horſe-dung.

§. 11. Horſe-dung, the leaſt pinguid and fat of any, taken as it falls, being the moſt fiery, excites to ſudden fermentation above any; wherefore 'tis then fit only for the hot-bed: but for fields it had need be well rotten, leſt it bring a couch, and pernicious weeds; the ſeeds of hay and other plants of which the horſes eat, come oftentimes entire from them: ſuch vegetables do commonly ſpring up from the ſoil of cattle, of which they chiefly eat, as long knot graſs from horſe-dung; ſhort, clean, and ſweet paſture, from the dung of ſheep and cows; the ſonchus or ſow-thiſtle from ſwine. fol. 317.

Neats-dung.

§. 12. Neats-dung univerſally of all others is moſt harmleſs, and the moſt uſeful; excellent to mix with ſandy and hot grounds, lean, or dry. fo. 318.

Sheep's-dung.

§. 13. Sheep's-dung is of a middle temper between cows-dung and pigeons-dung; profitable in cold grounds. fo. 318.

Pigeons-dung.

§. 14. Pigeons-dung and that of poultry is full of volatile ſalts, hot and fiery, and therefore moſt applicable to the coldeſt ground. Be this obſerved as a conſtant rule, that the hotter compoſts be early and thinly ſpread, and contra the colder. fo. 318.— Very efficacious is this dung to keep froſt out of the earth. ib. — As the effect of this dung is ſudden, ſo it laſts not long, and therefore muſt be the oftener renewed. fo. 319.

Blood.

§. 15. Blood is excellent with any ſoil where fruit is planted; and, as to it's improvements of corn-land, he tells you a ſtrange ſtory of the battle in Badnam fields in Devonſhire. fo. 319.

After the battle of Badnam fields in Devonſhire, ſays he, where Lord Hopton had a ſignal victory, the blood of the ſlain did ſo fertilize the ground, that moſt of the wheat ſtalks bore 2, 3, 4, yea to 7, and ſome to 14 ears; a thing almoſt incredible, but aſſuredly reported by diverſe eye-witneſſes. fol. 319. — I have given my opinion of this and the like tales under the article, Corn in general — ſee — Of many ears on one ſtalk. — He adds, that the blood and fleſh of animals is much more powerful for the enriching of land than their dung and excrements, and is computed at twenty times the advantage, and to the ſame advance above this is hair and calcined bones; and ſo the dung of pigeons and poultry feeding on corn does as much exceed that of beaſts, which feed on groſs vegetables, and one load of ſeed contains as much virtue as ten load of dung.

Wood-aſhes.

§. 16. Wood-aſhes are fit for wet ground: in the Eaſt-Indies, burning trees to aſhes is the only improvement, of which they ſtrew not above a buſhel to an acre; it likewiſe kills the worms; but in ground that is ſubject to over-heat and chap much, aſhes and burning compoſts do but increaſe the fever, and therefore contrary remedies ſhould be ſought, ſuch as neat's and ſwine's-dung; but not ſo, when lands are naturally or accidentally cold. fo. 320.

Dung ſhould not lay expoſed to the ſun and air.

§. 17. He diſapproves of laying dung in heaps in the field, expoſed to the ſun, rain, and drying winds, whereby all the ſpirit and ſtrength is carried away; and pretends to put us in a better method of managing our dunghills. —Let the bottom or ſides of a pit, ſays he, be about four feet deep, paved ſo with ſmall chalk or clay at the bottom, that it may hold water like a ciſtern; direct your channels and gutters about your houſe and ſtables to it. The pit muſt be under covert, ſo that the downright rains at leaſt may not fall into it. Lay a bed of dung in it a foot thick, on that a bed of fine mold, on that another bed of cyder-mere, rotten fruit, and garden offal, on this a couch of pigeons and poultry-dung, with more litter, and beds of all other variety of ſoil; upon all this caſt water plentifully from time to time: as for freſh dung, ſuch as ſheep make when folded, 'tis good to cover it with mold as ſoon as poſſible from the ſun. fo. 326.

§. 18. He accounts the warmth of the woolly fleeces of ſheep an improvement to land as well as their dung. fo. 308; and the very breath and treading of cattle, and their warm bodies is comfortable, and marvellouſly cheriſhing. ib. — Thus far Mr. Evelyn. — There is no great matter to be collected from the ancient writers on huſbandry in reſpect to this article of Manuring.

Manures uſed by the ancients.

[f] Pliny prefers cow-dung to horſe-dung; and, if the cows, or cattle that chew the cud, feed on as good meat as horſes, without doubt the dung, by reaſon of ſuch chewing, will be the finer. [g] Columella gives a like reaſon for preferring aſſes dung to that of any other beaſt; becauſe, ſays he, the aſs is a long time in grinding his meat, by which means it is more thoroughly digeſted, and fit to be laid on the ground immediately, as ſoon as made. Hogs dung he eſteems the worſt of all. — [h] Varro and Pamphilus agree, that the dung of geeſe, and all aquatick fowls, is of a bad kind; but the latter of theſe aſſigns a different cauſe for it from that given by our Engliſh writer: he attributes it only to it's too great humidity, whereas Mr. Evelyn reports it to be of a fiery quality. —— [i] Columella joins with [k] Varro in giving great commendations to pigeons-dung, beyond that of all other birds, on account of it's fermenting heat, and in adviſing to ſow it on the ground before the corn is harrowed in; but, if this is not to be procured, he directs us to make uſe

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[f] Inter fimos bovum præfertur antequam jumentorum. Plin. lib. 17. c. 9.

[g] Inter pecudum ſtercus optimum exiſtimatur quod aſinus facit, quandoquidem id animal lentiſſimè mandit, ideòque facilius conquoquit, et benè confectum æque idoneum protinus arvo fimum reddit. Deterrimum ex omnibus ſuillum habetur. Columella, lib. 2. c. 14.

[h] Malum eſt ſtercus anſerum, et aquaticarum volucrum, propter humiditatem. Pamphilus in Geoponicis, fol. 5.

[i] Antequam ſarrias, more ſeminantis, ex aviariis pulverem ſtercoris per ſegetem ſparge; ſi et is non erit, caprinum manu jacere, atque ita terram ſarculis permiſcere, ea res lætas ſegetes reddit. Columella, lib. 2. fol. 108.

[k] Stercus optimum eſt volucrum, præter paluſtrium et nantium; de hiſce præſtare columbinum, quod ſit calidiſſimum, et fermentare poſſit terram: id ut ſemen aſpergi in agro oportere. Varro, lib. 1. ſect. 43.

of goats-dung in it's ſtead. [l] Pliny recommends earth that is ſalt, as preventive of, or deſtructive to inſects; and this may be one of the great advantages from lime, ſoot, pigeons-dung, and often tilling the ground: [m] It is agreed on, ſays he, by every one, that there is no manure more profitable than lupines, ploughed into the ground before they have kidded,

Dung, it's inſufficiency to poor land.

§. 19. The maintenance corn muſt depend on, is the innate digeſted ſalts of the earth, and well concocted juices, which are not to be obtained by the præcocious way, the ſame year the land is dung'd; dunging is but a weak ſupport for very poor land to depend on; 'tis a good ſauce to the noble juices, which are before in the land, to heighten them: but if you think dung alone a ſufficient nouriſhment, where the land is before poor, you will find, that in ſuch caſe the corn will run out to a ſtraw, and the grain to a thin body with little flour; and that very poor land ſhall be as little able to bear good dunging, as a poor man, whoſe blood is poor, much ſtrong drink: the very quinteſcence in earth, which improves grain, ſeems to depend very much on the air, ſun, and rains incorporated with the earth, which ſeem principally to give birth and life to vegetables; for the receiving of which principles the dung has not had time, which is newly depoſited on the earth: how much is to be attributed to theſe principles is eaſy to be ſeen, if Mr. Ray, Grew, and Malpigius be conſulted.

Dung of cattle good in proportion to the goodneſs of their food.

§. 20. In diſcourſe with farmer Sartain of Broughton in Wilts, and other farmers, I was ſaying, that the tails and the improvement of the dung of cattle was anſwerable to the food they feed on, and gave ſeveral inſtances of it; to which farmer Sartain replied, They were ſenſible alſo, that, when they foddered with the beſt meadow-hay, it made their grounds quite another thing in goodneſs, than when they foddered with a coarſer hay. —— Farmer Stephens of Pomroy aſſented to this, and added, that the ſheep ſlate in the common of Pomroy was of ſo rowty, wet, and poor a graſs, that the tails of the ſheep that fed on it would do land no good: to confirm his report, he led me to a good healthy ground, which he had ſowed to wheat, and which he had folded with theſe ſheep, ſo rich in appearance, that no ground could be ſeen for the trundles, and yet by the corn there was no ſign of the good effects it had on the land; and the trundles, if you broke them, were as coarſe as rabbet-dung. This makes therefore for the improvements by graſs-ſeeds in poor lands, foraſmuch as the ſheep gain not thereby a good belly-full only, but alſo their dung has greater virtue.

Of dunging poor land next a hedge.

§. 21. If you divide the poorer part of a ground from the better, leave two or three lugg in depth of the poorer ground within the hedge of the better ground; becauſe the cattle love to creep to the hedge-ſide, and will improve that poorer part by their dunging on it.

§. 22. That

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[l] Salſæ terræ multo melius creduntur, tutiora a vitiis innaſcentium animalium.

[m] Inter omnes conſtat nihil eſſe utilius lupini ſegete, priuſquam ſiliquetur, aratro vel bidentibus verſa. Plin. lib. 17. c. 9.

☞ Mr. Miller remarks, that in Italy, to this day, they cut down the narrow-leaved tall turnips, when in flower, and plough them into their ground as manure.

Horſe-dung preferable to cow-dung.

§. 22. That part of my barley, which had been dunged with horſe-dung the year before for wheat, was twice as good as that part, which the ſame year was dunged with cow-dung, though that part dunged with cow-dung was rather the better land.

Horſe-dung, when to lay it on.

§. 23. Horſe-dung being laid on wheat-land juſt before it is ſowed, and then ploughed in, and ſowed on one earth, (which is often done in the hill-country, where the land is light) is apt through the fire of the dung to run out the corn faſter than the digeſtion of the ſtalk can be made; and ſo the parts being looſe and hollow in the texture, when the winter comes, the cold pierces it ſo, that it withers and dies; whereas dung ſhould either, on ſuch land, be laid and ſpread a month before the ground is ploughed and ſowed, or elſe ſhould be ploughed in a fortnight before the ground is ſowed.

Dung of fatting beaſts preferable to that of milch cows.

§. 24. Lord Shaftſbury complained to me, that he did not find feeding his grounds with cows, improved them. I told his lordſhip the reaſon I believed was, becauſe his cows were milch cows, not fatting beaſts; for the dung of milch cattle cannot improve lands like the dung of fatting beaſts, the milking them ſolliciting the fat and nouriſhment of the creature to follow the current of the milk, whereby the dung is much the poorer; and why weather-fold is worſe than ewe-fold, I conceive to be, becauſe the nouriſhment of the weather goes into his growth.

Of hiring ſheep for their dung.

§. 25. I ask'd a Wiltſhire man what the tails of a hundred ſheep might be worth, if one was to hire them. He ſaid, that ſometimes he had known ſheep to be let out, and they have had 12 d. per night for lending a hundred ſheep to fold, which is looked on of as good a value as a good load of pot-dung. Note, in Leiceſterſhire one may have the fold of 200 for 12d. per night.

Ewes dung preferable to that of weathers.

§. 26. Mr. Davers of Cauſum in Wiltſhire aſſures me, that notable countrymen have told him, that in dividing the ewes from the weathers, in folding in the ſame ground, they have had much the better corn where they have folded the ewes. Mr. Davers thought it was from the lambs, becauſe their dung muſt be richer from the milk they ſucked from the ewes. I have given my ſentiments on this point in a former obſervation; but quære whether the ſoil of all gelt creatures, is not leſs generous and rich than that of others. I told Mr. Davers, that I had been aſſured, if cattle had poor mean hay given them, the ſoil of 'em would do the ground little ſervice, to which he aſſented; and he ſaid further, that horſes dung when they were at graſs rather impoveriſhed than better'd the land, whereas what came out of the ſtable was otherwiſe.

Time of carrying out ſome ſorts of manure.

§. 27. Carry out horſe-piſs, cows-piſs, hogs-piſs, when they are frozen and in ice.

Malt-duſt mixed with pigeons-dung.

Many huſbandmen fling layers of malt-duſt into the pigeon-houſes, and, when it is well covered, fling another layer, and ſow it mix'd thus together on their grounds, and find, they ſay, great advantage in it. I have not as yet had experience of it, but have heard it greatly commended, and believe it to be a good way.

§. 28. Shar-

Cautions in uſing pigeon and poultry-dung.

§. 28. Sharrock ſays, fo. 91. For cold land, pigeon and poultry-dung[n] is very uſeful, which abound in volatile ſalt; theſe are only ſowed by the hand, for fear of burning the corn in the chitting of the grain.—I have obſerved where theſe dungs have been over plentifully laid, that the place bore no corn at all, whereas in other places, where it was moderately ſtrewed, the crop was exceeding great; the ſame effect there is in urine and ſoot, from the very eager ſpirit, and volatile ſalt, and therefore the ſame caution is to be had in their uſe: horſe-dung, if not rotten, lying thick will do the ſame.

Quantity of pigeons-dung on an acre.

§. 29. Mr. Putching of Leiceſterſhire ſays, They commonly ſow two quarters of pigeons-dung on an acre, (which is ſixteen buſhels) and their method of ſowing it is, to ſow it after the corn, and before the corn is harrowed in: in meadows he ſuppoſes eight buſhels on an acre is enough.

Pigeons-dung preferable to poultry-dung.

§. 30. It may be judged that pigeons-dung is better than poultry-dung, from Mr. Evelyn's view of them by a microſcope; for he ſays, that pigeons-dung is conſtituted of a ſtiff glutinous matter, eaſily reducible to a duſt, of a grey colour, with ſome huſky atoms after dilution; but the dung of poultry was ſo full of gravelly ſmall ſtones and ſand, that there appeared no other ſubſtance, ſave a very ſmall portion both of white and blackiſh viſcous matter, twiſted up together, of all the other the moſt fætid and ill ſmelling. Evelyn, fo. 295.

Pigeons-dung, price and manner of ſowing it.

§. 31. Sir Ambroſe Phillipps ſells his pigeons-dung for 4d. per buſhel, which is 2s. 8d. per quarter; one Gimſon bought it, and laid it on light ſandy land, and, it proving a hot ſummer, he thought it did his barley rather harm than good. Mr. Putching is very fond of this dung, and buys it for 2s. 6d. per quarter, and ſows two quarters, and ſometimes three on an acre, which he thinks is beſt: he ſows it after his barley is in the ground, before harrowing, and harrows in both together: he alſo ſows it in the ſame manner on his wheat-land, and in caſe a wet and cold ſpring comes upon his barley, ſo that he is like to have little in his furrows, he flings about a ſack on an acre, between the furrows, and finds it to ſtrengthen and comfort the cold land ſo, that he has as good corn there as on the ridges: he bad me but try, and I ſhould have as good an opinion of it as he had. Mr. Clerk of Ditchly told me afterwards, that Sir Ambroſe ſowed commonly five quarters on an acre.

To manage pigeons-dung.

§. 32. The gentlemen mentioned in the preceding obſervation agreed, that the beſt way to manage pigeons-dung in a dove-houſe, was often to lay a layer of ſtraw upon it; but then it will be amaſs'd to ſo great a bulk, that it muſt often be removed to ſome place, where it may lie from the power of the weather.

Soot and pigeons-dung.

§. 33. Sharrock tells us, fo. 134. Soot and pigeons-dung abound much in volatile ſalt; and I have this year (1703) on a cold and moiſt clay, ſeen excellent advantage on the graſs thereby, it being only ſtrewed thin on the graſs before ſpring; but of the two ſoot was the beſt.

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[n] Mr. Miller ſays, the dung of pigeons, hens, and geeſe are great improvers of meadow or corn-land; the firſt of theſe being the beſt ſuperficial improvement that can be laid on meadow or corn-land: but, before it is uſed, it ought to have lain abroad out of the dove-houſe ſome time, that the air may have a little ſweetened it, and mollified the fiery heat that is in this dung.

Soot to kill moſs.

§. 34. Cook ſays, fo. 19. Soot is good to kill moſs; it's heat kills the roots, for they lie on the top of the earth.

Soot to lay on green wheat.

§. 35. I find in Leiceſterſhire many do fling ſoot on their green wheat in February, ſo as to blacken the land with it; therefore I need not fear burning my wheat with it, at that time at Eaſton. The ſoot from the ſea-coal is eſteemed the beſt.

Coal-aſhes good for St. Foin.

§. 36. A notable farmer told me, that he had tried all ways of managing French graſs, by dung, and fold, &c. and had found coal-aſhes the only, or beſt improvement.— Qu. Therefore why not beak-land burnt; and why may not theſe be the beſt improvements, becauſe they will not create and encourage a rowty graſs to ariſe, to choak the French graſs, as Mr. Methuen had obſerved dung to do.

Id. the reaſon.

It ſeems to me, that aſhes may be propereſt to French graſs, inaſmuch as they kill the natural graſs, from the ſame reaſon as the ſalt of brine does, or urine thrown on gravel-walks; and aſhes have a ſtrong ſalt in them; yet this ſalt is beneficial to the roots of the French graſs, becauſe it has a tap-root, which runs deep, and the ſalt of the aſhes is very well qualified before it ſinks down to the roots of the French graſs.

Rotten wood.

§. 37. J. Mortimer, Eſq; F. R. S. fo. 380. reckons rotten wood of hedges and coppices to be a great improver of the ſoil where it drops, and inſtances the earth where faggot-piles have been uſed to ſtand.

Rotten leaves.

§. 38. Quinteny ſays, the dung of leaves thoroughly rotten, is hardly fit for any thing but to be thrown over new ſown beds, to hinder the rains, or waterings, from beating too much on the ſurface, and ſo hinder the ſeeds from riſing;— and no doubt 'tis the ſame with corn. Part 1. fo. 5.

Sea-ware and marle.

§. 39. Martin of the Weſtern iſles ſays, the manuring with ſea-ware is an univerſal huſbandry throughout thoſe iſlands, fo. 53. &c. In the iſle of Altig, he reports, that, by manuring healthy ground with ſea-ware, many ſtalks had five ears growing on them; fo. 140; and in the iſle of Skie, by an improvement of marle, 35 fold increaſe was had, and many ſtalks carried five ears of barley; and he aſſures us this account was given him by the then poſſeſſor of the land; fo. 132. [o] But I have in another place given my opinion, that theſe ſuperfætations are not probable.

Malt-duſt.

§. 40. King of Ilſley in Berkſhire ſays, that the malt-duſt ſowed on barley-land did very little good laſt ſummer (anno 1699) by reaſon of the drought; for, no rain falling from ſowing time till the ſeed was come up, the ſtrength of the duſt was not waſhed into the land.

He ſaid, it was common in thoſe parts of Berkſhire to lay malt-duſt on wheat-land, and to fling it on at the time they ſow the wheat, and harrow it in together, and a very good improvement it was; but, ſaid he withal, I have heard huſbandmen argue that point; and hold, that malt-duſt is better for ſummer-corn than for wheat, and they give this reaſon for it; the winter corn lies a whole year in the ground, and the malt-duſt will have ſpent it's ſtrength by the time the winter is over, and not hold up the corn in heart all the ſummer: they ſow with the wheat two quarters of malt-duſt to an acre, which makes four quarters of corn-meaſure.

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[o] Vid. Corn in general.

Farmer Ratty aſſured me, that malt-duſt went beyond dung on clay-land; for 'tis on ſuch land, not on light land, that he has had the experience of it; and that farmer Hawkins knows this very well, tho' he does not care others ſhould, leſt the price ſhould grow dearer: he ſays, he lays twenty ſacks on an acre, of the ordinary four-buſhel-ſacks, which he buys at Whitchurch at 1 s. per ſack. He ſows on his wheat-ground, not dung'd nor folded, about February, and he ſays the wheat will ſurpaſs the dunged-wheat, and the ground will produce a good barley-crop afterwards, tho' ſuppoſed to the contrary.

Mr. Thomſon of Loughborough aſſures me, that malt-duſt laid on cold graſs-grounds makes a great improvement: he ſays, he lays after the rate of four quarters on an acre, on ſuch ground, but 'twould be better to lay ſix or ſeven. Note, five quarters on an acre is a peck on a lugg-ſquare; 7½ quarters is a peck and an half. It ſeems it would be agreeable on our cold clay-meadows.

I have obſerv'd of dungs, and lime, and ſtrong beer, that they afford no ſpirits, or vegetable ſalts, till they have paſs'd a fermentation by fire, whereby their ſpirits or ſalts are raiſed and ſecreted; ſo I look on the ſame obſervation to hold good in malt and barley; ground barley being of little profit to land if laid on it; whereas ground-malt laid on land, (tho' 'twould be madneſs to do it) as we may judge by the malt-duſt, would yield a great produce.

Mr. Clerk ſays, he uſes the kiln-duſt of the malt himſelf, viz. that duſt which comes through the hair-cloth, which he looks on to be better than the other: he laid (he ſaid) ten quarters upon an acre, both on his graſs-ground and barley, about January or February. I ask'd him if it would not be apt to burn the ground, not being laid on earlier; he ſaid, one ſhower of rain he thought waſh'd the heat out of it. As to the largeſt tail-duſt of the malt, he ſold it for 4 d. per buſhel, to people to feed pigs with.

Woollen rags.

§. 43. In diſcourſe with King on the ſubject of woollen rags, he aſſured me of ſtrange effects from them, which improve to four or five crops. He ſaid they might be bought at London for 2 s. or 2 s. 6 d. per hundred weight, 112 lb. to the hundred; old people might be hired to cut them on a block, which would coſt about 6 d. per hundred. Lay of theſe chopt ſmall, to an inch or two ſquare; ſow them by ſcattering them out of the ſeed-lip at the ſecond ploughing or earth, about the latter end of July: being thus covered, they will grow finnowy or moldy by ſeed-time [p].

§. 44. It

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[p] Beſide the manures ſpoken of by our author, there are two others much commended by Mr. Miller, which are rotten tanners bark, and rotten vegetables.—Oak-bark, ſays he, after the tanners have uſed it for tanning of leather, when laid in a heap, and rotted, is an excellent manure, eſpecially

Worms good for drawing long dung into the ground.

§. 44. It is a common and well approved of method in huſbandry, at Litchfield in Hampſhire, and the neighbourhood thereof, to carry out long dung, and lay it on lay-ground, that is light and whitiſh, and to let the worms draw it in, being laid early; then to plough it up and ſow it on one earth; but it muſt not be ſtrong land, becauſe that can't be ſowed on one earth.

Dung, time of laying it on.

§ 45. It is a frequent practice in the hill-country to pot-dung land, run to graſs and to a ſword, in July, and to plough in the dung, and ſow it on one earth with wheat, the latter end of Auguſt, or a week in September; and true it is, that, though the ground be graſſy and ſwordy, as it will be in our hill-country by two years lying to graſs, and tho' the ſpring be very dry, as alſo the ſummer, yet in April and May, when the ſun gets ſtrength, and warms the ground, the ſpirits of the dung will be drawn out of the ground upwards, as will plainly appear by the good deep colour of the wheat, and the thickneſs and thriving condition of it; however 'tis plain by ſeveral experiments I have made this way, that the mellower and looſer the ground is, you thus manage, the better the ſpirits of the dung will be drawn upwards, through the earth, to the roots of the corn, as has appeared to me, both by the thickneſs and colour; therefore the huſbanding land this way, which is run to a matted ſword, ought, as much as can be, to be avoided. Corn thus huſbanded will thrive very little during the winter, nor until warm weather comes: from hence

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cially for ſtiff cold land; in which one load of this manure will improve the ground more, and laſt longer, than two loads of the richeſt dungs. It is better for cold ſtrong land than for light hot ground, becauſe it is of a warm nature, and will looſen and ſeparate the earth; ſo that where this manure has been uſed three or four times, it hath made the land very looſe, which before was ſtrong, and not eaſy to be wrought. When this manure is laid on graſs, it ſhould be done ſoon after Michaelmas, that the winter rains may waſh it into the ground; for, if it is laid on in the ſpring, it will burn the graſs, and, inſtead of improving it, will greatly injure it for that ſeaſon. Where it is uſed for corn-land, it ſhould be ſpread on the ſurface before the laſt ploughing, that it may be turned down for the fibres of the corn to reach it in the ſpring; for, if it lies too near the ſurface, it will forward the growth of corn in winter; but in the ſpring, when the nouriſhment is chiefly wanted to encourage the ſtems, it will be nearly conſumed, and the corn will receive little advantage from it. - Rotten vegetables of moſt ſorts alſo greatly enrich land; ſo that, where other manure is ſcarce, theſe may be uſed with great ſucceſs. The weeds of ponds, lakes, or ditches, being dragged out before they ſeed, and laid in heaps to rot, will make excellent manure, as will moſt other ſorts of weeds. But where-ever any of theſe are employed, they ſhould be cut down as ſoon as they begin to flower; for, if they are ſuffered to ſtand until their ſeeds are ripe, the land will be ſtored with weeds, which cannot be deſtroyed in two or three years; nay, ſome kinds of weeds, if they are permitted to ſtand ſo long as to form their ſeed, will perfect them after they are cut down, which may be equally prejudicial to the land: therefore the ſureſt method is to cut them down juſt as they begin to flower; at which time moſt ſorts of vegetables are in their greateſt vigour, being then ſtronger, and fuller of juice, than when their ſeeds are farther advanced; ſo that at that time they abound moſt with ſalts, and therefore are more proper for the intended purpoſe. In rotting theſe vegetables it will be proper to mix ſome earth, mud, or any other ſuch like ſubſtance with them, to prevent their taking fire in their fermentation; which they are very ſubject to, where they are laid in large heaps, without any other mixture to prevent it; and it will be proper to cover the heaps over with earth, mud, or dung, to detain the ſalts; otherwiſe many of the finer particles will evaporate in fermenting. When theſe vegetables are thoroughly rotted, they will form a ſolid maſs, which will cut like butter, and be very full of oil, which will greatly enrich the land.--- He commends likewiſe ſea-ſand, ſhells, and corals, eſpecially for a ſtrong loam, inclining to clay; but adds, as theſe bodies are hard, the improvement is not the firſt or ſecond year, becauſe they require time to pulverize them, before their ſalts can mix with the earth to impregnate it.

hence it may ſeem, that to carry out dung on ſuch land the beginning of June, and plough it in whilſt the ſun is hot, and has a good ſeaſon to hold ſo, is better huſbandry than to defer it till Auguſt; for the ſun will exhale upwards the ſpirit of the dung. In poor ground it ſeems proper to me to ſummer-fallow it, (if lay-ground run to graſs) and ſtir it in the winter, in order to ſow it at ſpring with oats or barley and French graſs, in order to feed the French graſs with cows during the ſummer, after the roots are well eſtabliſhed; and ſuch feeding will not kill the French graſs in ſuch poor ground; for there can be no danger of ſuch exuberancy of ſap, that the root ſhould fall under a plethory: in autumn it may be fed a little with ſheep without prejudice.

From the above obſervation, how the dung plough'd in under furrow is drawn up to the roots of the corn by the ſtrength of the ſun, may be explained, in the ſame manner, how graſs in the hotteſt ſummers comes to have moſt goodneſs and ſpirit, as is experimentally proved by deer, ſheep, and other cattle thriving by it (tho' plenty of rain does moſt contribute to increaſe of growth) the effluvia which lie deep, being ſo exhaled to the roots.

Mr. Biſſy and Mr. Slade being with me, when in the month of July or Auguſt I was carrying out my dung to lay on land that was ſwordy, in order to ſpread it, and turn it under furrow, they did not approve of that huſbandry; Mr. Slade ſaid, he found it a much better way to carry it out in the ſpring, i. e. about May, to lay on ground not apt to run to graſs, and let it be waſh'd in, which will mellow the ground, and hollow it; and then turn it in at Midſummer, and ſow it on one earth. Mr. Biſſy ſaid, he found it always the beſt way, if dung was free from weeds, and ſhort, ſuch as ox-dung and horſe-dung that would ſpit, to carry it out on the ground plough'd up to ſow on one earth, a little before you ſow it, and drag it in: he ſaid, he always found the beſt corn by ſuch huſbandry, and would have perſuaded me to try it.

To lay pot-dung near home.

§. 46. It ſeems to me, that the grounds near the houſe ought to have the dung, in regard of the cheapneſs of carriage, and in regard that three loads of corn may be carried in from thence, inſtead of one from a farther diſtance; and if ſuch grounds conſequently by rich crops of graſs-ſeeds maintain a treble ſtock, what matter is it whether the grounds at a diſtance have the dung at the firſt hand or ſecond, I mean by the tails of ſheep? Beſides, the richer the grounds near to your backſide are, the more they will anſwer in the produce of graſs, and in being of more general conveniency, as in maintaining lambs at lambing-time, in fatting hogs by broad clover, in maintaining horſes and mares with food, in bringing good goar-vetches, in the eaſy carting of a good burthen of graſs-ſeed-hay; and, if not folding, other methods may be uſed in manuring grounds at a diſtance, ſuch as ploughing in goar-vetches, liming, rags, ſowing to French graſs, watering, &c. — The farmers however argue from experience, that we muſt ſometimes change our manure from the fold to pot-dung, and not always fold on the ſame land.

§. 47. They who are curious in ſelling ſeed-corn, will not allow a load of corn or dung at harveſt to come through their wheat-fallow.

Dung ſhould not lie near the corn-carting.

§. 48. If dung lies near the corn-carting, and not carried out before harveſt, ſo many ſorts of corn will be littered in it, which will not have time to rot, that you muſt expect a crop foul with trumpery.

Mold, to lay it on.

§. 49. I hold it much the better way, if earth be carried out as a ſoil to land, not to ſpread the earth on the land till the laſt earth be given for the corn, and then to ſpread it, and harrow it in with the corn with new harrow-tinings or drags; hereby the earth will not be buried.

Of turning dung.

§. 50. One of my labourers was going to turn the dung for me into heaps in the foddering barton; he aſked me, if he ſhould ſtir it all; he ſaid, 'twas beſt to turn it all, and not lay the mixen he flung up on the top of the reſt; for though 'twas ſomething more charge, yet 'twould rot the better. Farmer Elton coming by, told me, I did well in it, for 'twas much the better way.

Straw, to manage it for dung.

§. 51. If ſtraw, not half dung, be carried out into the fields, and laid in heaps, and after rains turned, it will become dung in good time.

Mr. Raymond of Puck-Shipton in Wiltſhire viſiting me, I told him, I intended to dig my farm-yard deep into holes, whereabouts the kine foddered, that in thoſe holes I might let the wet into my dung, that it might rot the better. He immediately diſapproved much of it, and ſaid, that way the dung would never rot; for ſtraw was like weed, and other things, which lying always wet would never rot; but that which would make ſtraw rot was to let it lie often wet and often dry; therefore, ſaid he, we always covet as dry a farm-yard as we can get, for the rains will wet the ſtraw often enough; or, if it chance to be a very long dry ſeaſon, you may wet it by throwing water on it. — I have ſince found by experience, that, if dung lies always wet, it will not heat well, nor rot, and that it waſtes itſelf and it's ſtrength by the wet; therefore no better huſbandry than to fling it into a heap.

1701 was a mighty corn-year, and a year which ran much to halm; ſo that the beaſts could not eat up their ſtraw, but it lay in the barton not half dung; I propoſed carrying out the ſtraw or longiſh dung, and laying it on my wheaten lay; a layer of ſtraw, and a layer of wet and rotteniſh dung, thinking the wet and tolerably digeſted dung might rot the ſtraw; but John Stephens of Aſhmonſworth, and farmer Croſs ſaid, the long ſtraw had better lie in the barton to take ſome rains, and then being well wetted, and carried forth, it might by the wheat-ſeed-time be dung, but, according to the way I propoſed, by that time it would produce nothing but finnowy or moldy ſtraw.

§. 52. Columella adviſes to keep dung in a heap till it is a year old, and no longer; for after that age, ſays he, it loſes it's ſtrength.

Age of dung.

That new dung on cold land will run corn into ſtraw, and make a great ſhew of corn, I doubt not; but I do believe, the dung of one year old will produce the fuller bodied corn.—Uſing dung however of only a year old, to dung a wheaten crop, ſeems to be the occaſion of the great produce of weeds in our corn-land in England.

§. 53. For three or four years they were very fond at Huſborne in Hampſhire of laying their dung on the land, and ſpreading it after the corn was ſown and harrowed; but they grew weary of it; for their land was pretty light of itſelf, and the worms working up for the dung made it too light.

Time and manner of laying on dung.

I was going from Holt through Tilſhade to Saliſbury; Tilſhade is on the downs; I obſerved the village was carrying out long dung, which being in or about October (as I thought an improper ſeaſon) it invited me to aſk the reaſon. They told me, it was to lay on their ground ſowed to vetches, and that they did not ſow their vetches till the middle or latter end of October, when their wheat-land was ſowed. Quære farther of this huſbandry; for it ſeems to me, where land is ſowed late, it muſt be good huſbandry, and bring the vetches forward, and warm, and comfort them, eſpecially where land is light and weak, as it is generally about Tilſhade, being a fine barley-land.

Farmer Elton adviſed me always, when I carried my dung out into the ground, to ſpread it immediately; it will, ſaid he, make the ground kirnel and fallow better, whereas to leave it in the heaps will rather hurt the corn, and make it lodge and grow up rank. — But, ſaid Oliver afterwards, when I was talking to him of it, we often lay it in heaps on the ground; and in ſuch caſe, when we carry it on the land, we dig away from the mixen the earth underneath about half a foot.

I was obſerving to farmer Biggs, that farmer Bond of Highclear flung no dung, in the ſpurning or ſpreading it, into the furrows, but carried a ſpit all along from the heap, and ſpread it near to the brink of the furrows, and ſo ſpurned to it. John Biggs ſaid, he never ſaw it done, but that doubtleſs 'twas a very good way; for to fling dung into the furrows was to double dung them, by reaſon that on each ſide the furrow a furrow was veered in on the furrow —— [p] Prudent huſbandmen, ſays Columella, chooſe to lay their dung on the upper ground rather than on the lower (or to dung the ridges rather than the furrows) becauſe the rains will waſh down the richer particles.

Quære, if ploughing in dung at ſtirring time may not be beſt, becauſe of making the weeds grow, which are ploughed in at ſowing the wheat.

Columella adviſes to plough in dung as ſoon as it is ſpread, that it's ſtrength may not be exhauſted by the power of the ſun, and that the ground may be mellowed and enriched by thus lying mixed with it; therefore, adds he, you ought not to ſpread more dung than you can plough in a day[q].

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[p] Prudentes agricolæ etiam in aratis collem magis quam vallem ſtercorant, quia pluviæ ſemper omnem pinguiorem materiam in ima deducunt. Columella, lib. 2. ch. 18.

[q] Disjectum protinus fimum inarari, et obrui convenit, ne ſolis habitu vires amittat, et ut permiſta humus prædicto alimento pingueſcat; itaque, cum in agro diſponentur acervi ſtercoris, non debet major modus eorum diſſipari, quam quem bubulci eodem die poſſint obruere. Columella, lib. 8. fo. 100.

METHOD

METHOD of manuring different LANDS.

Of dunged land in a wet year.

§. 54. Dunged land, in a wet year, bears the worſt corn, eſpecially if it be low ſtiff land; for dung then holdeth the moiſture, and the ground being then wet withal, commonly doth produce a great many weeds, which can digeſt the ſpirit of the earth and water better than the corn can, becauſe they grow much quicker. Cook, fo. 31.

Of dunging land that is hard ploughed.

§. 55. Ground hard ploughed is apt to run to weeds, and dunging it, or folding on it early will make it more ſubject ſo to do; for that will promote and forward the natural produce of the ground.

The beſt ground ought to be moſt and principally improved.

§. 56. When we go on the improvements of land by dung, fold, or other manures, it ought firſt to be conſidered, what return we expect of profit; upon which conſideration, I think, the gentleman, who undertakes the management of his own land, ought firſt to apply his manures in improvements to his clay-arable and mixt-arable; becauſe the ſame expence ſhall double the value of ſuch lands, and thereby render an acre of 10 s. per ann. to be worth 20 s.——Whereas the ſame expence on poor white land, or poor ſandy land, &c. of perhaps no more than 1 s. per acre, though it augments the value of the acre four times, is an improvement but of 4 s. per acre per ann. and then the improvements on ſuch poor lands are not ſo laſting. 'Tis true however, there is one ſort of manure always to be applied to white, ſandy, or poor light lands from the firſt entrance into huſbandry, which is your marles and ſtrong earths, from whenceſoever they are removed. From hence it may be inferred, that thoſe do not beſt, who, when they build farm-houſes, chooſe the ſituation on the moſt barren parts; for, if their grounds be healthy, and not worth above 10 s. per acre per ann. 'tis more profitable to have the ſituation of a farm there.

Land that is worth 5 s. per acre, and land that is worth 10 s. per acre, and land that will bear two quarters per acre, and land that will bear four quarters per acre, do differ vaſtly in proportion of value; for, whereas the land that is worth 10 s. per acre is only double the value of that which is worth 5, the land that will bear four quarters may very well be worth ten times the value of the land that will bear but two quarters; becauſe the price of ſeeding, dunging, folding, ſowing, ploughing, weeding, mowing or reaping, &c. of the four quarters per acre barley is no more than of the two quarters per acre barley.

Wet ground to be dunged more than dry.

§. 57. Palladius tells us, that a wet ſoil requires more dung than a dry one [r].

Of ſuiting your dung to your ſoil.

§. 58. Monſieur de Quinteny's obſervation, abridged by London and Wiſe, fo. 29, is as follows, viz. Since the great defects of earth are too much moiſture, coldneſs, and heavineſs, as alſo lightneſs, and an inclination to parching, ſo amongſt dungs ſome are fat and cooling, as the dung of oxen and cows; others hot and light, as ſheep, horſes, and pigeons-dung: and whereas the remedy muſt have virtues contrary to the diſtemper it is to cure; therefore hot and dry dungs muſt be uſed in cold, moiſt, heavy earths, and open and looſe dung, in lean, dry, light earths, to make them fatter and cloſer.

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[r] Ager aquoſus plus ſtercoris quærit, ſiccus minus. Pallad. lib. 1. ſect. 6.

Dung on ſandy ground, how to be laid on.

§. 59. If you lay dung on a ſandy or rocky ground, where it will be weeping away, the oftener, and leſs at a time you lay, ſo much the better; for if one lay treble the quantity, it will as ſoon paſs through as a leſs quantity.

Time of dunging whitiſh land.

§. 60. It ſeems to me, that he who ſows whitiſh land to wheat, and dungs it, ought to dung it early in the year, and plough it in, that ſo the earth may have time to drink it up; for, if white land be dunged late, being of a dry nature, the wheat will have little goodneſs from it: I experienced this to my coſt.

Manure for black, mooriſh land.

§. 61. I had been to view a neighbouring farmer's black, mooriſh earth, which was truly of the nature of black heath: I aſked him, what manure he found beſt for ſuch land; he anſwered me, to fling pigeons-dung or malt-duſt upon the ſurface of it; nay, ſaid he, if I dung it, I fling dung upon it after 'tis ſowed. And truly I think this the beſt way to manage ſuch land; for hereby the dung will be kept longeſt in the ground, which is too apt to run downwards, and to be loſt in ploughing it in, and to waſh away; and if ſuch ground was never ſowed but one crop at a time, and laid down to graſs, and the goodneſs of the ſurface turned in, for a ſecond crop, it would I believe be beſt; and if it was refreſhed again by a ſprinkling of pigeons-dung, whilſt the crop is growing, it would not be amiſs.

Cauſe why wet ſpewy clays are not improved by dunging.

§. 62. The wet ſpewy clays about Holt in Wiltſhire (of which ſort, as well as in other places, there are abundance) are obſerved by the moſt experienced perſons in huſbandry not to anſwer the deſigns of thoſe who pretend to improve by dung; the reaſon of which I fully obſerved this ſpring; (anno 1707); for being here (at Holt) in the month of March, when the wind was very buſy, every lugg ſquare of the ground cleft many thouſand ways, ſo that there was not a piece of earth to be ſeen, on which one might ſet the ſole of one's foot, but it had large gapings in it. The ſame alſo it ſuffers in the heat of ſummer; from whence it is plain, that though theſe lands are of a ſtrong clay, which generally pay for their manure the beſt, yet being in this caſe too obſtinate, and clung ſo that they could not eaſily dry, without ſplitting juſt like green boards, the moiſture of all manures muſt needs be waſhed down, when rains come, through many hiatus's, which in a moſt hungry manner ſeem to gape for the vital ſubſtance of the earth; and ſo the ſoil is immediately carried down below the roots of all vegetables.

Whether to lay dung on the lay-land or fallows.

§. 63. Diſcourſing with ſeveral farmers about the beſt way to lay dung on the ground, whether on the lay-land or fallows, they ſeemed in general to agree, that the beſt huſbandry was to lay it on the wheat-fallows, and then to ſtir it lightly in, if the land be ſtrong lay-ground; for if it be laid on the lay, and then ploughed in, it will be apt to break up ſo deep, and thereby the dung be ſo covered, that it will hardly turn up in the other ſtirrings afterwards.

When to dung meadows.

§. 64. I found by experience this year (1701) that the earlier dung, or eſpecially pond-mud, and coal-aſhes, are laid on the meads, ſo that they may be waſhed in, the better the graſs may be mowed.

Benefit of dunging them.

§. 65. To dung meadows and make them very rich in our hill-country, is excellent huſbandry, not only for the greater quantity of hay they produce, but becauſe thereby they yield a good bite of graſs at lambing-time, which is to be valued according to the occaſion, and with which we cannot be ſupplied for money: the after-maſs alſo, which is much the greater, for it, leſſens the conſumption of corn by horſes, and makes a halt cow fat, with neither of which one can be ſupplied but at unreaſonable rates.

When to dung them.

§. 66. In March this year (1706) I folded at lambing-time part of a mead, and fed the whole mead that year; but both cows and horſes neglected that part that had been folded, and ſuffered it to grow up to great rankneſs; whereas the other part of the mead, eſpecially the ſideling piece, which had aſhes laid on it in the winter, they eat very bare; by which I do infer, all ſorts of dung ought to be laid on in October, that the heat of them may be waſted by ſpring, and not taint the juices of the graſs, and that aſhes make the ſweeter graſs.

Straw, lay it on the meadows in winter.

§. 67. I had farmer Biggs, Bachelour, and Crap, three excellent farmers, with me. — In our diſcourſe about the improvement of meadows, they all allowed of the bringing ſtraw thereon in the winter, for the worms to draw it in, to be very exceeding good huſbandry; and farmer Bachelour ſaid, he knew of nothing better than old thatch ſo drawn in upon meadows.

Dung for barley land.

§. 68. I believe that fine mortar-earth or mixed mold, which is excellent good ſoil for barley, carries the finer barley for being dung'd; for the dung mends the deficiency of ſuch ground, which is inclinable to be too poor; but I do believe, on coarſe clay-land, whereon the barley runs naturally coarſe, dung rather makes it the coarſer; for the infirmity of ſuch ground is to be too rank, and coarſe, and is ſtill coarſer for the dung.

Oats and barley not dunged in the hill-country.

§. 69. They never dung oats nor barley in Hants. In the hill-country oats do well without dung, and barley has the ſtrength of the dung ſufficiently after the wheaten crop.

Of dunging linchets.

§. 70. I was telling an experienced farmer, that I had ploughed down the linchet of a certain acre; and that my bailiff foretold me, I ſhould have the pooreſt wheat on that linchet; which I wondered at, in regard of the richneſs of the ground; his reaſon was, that the harrows would draw down all the good * grete on the half lugg-lands-breadth below. The farmer ſaid, 'twas very true, that in about three years ploughing 'twould be ſo, but not in one year, as he knew by experience; therefore the brows of the linchets are to be well dunged. This argues, to dung a linchet you muſt lay the heaps above it.

§. 71. Though

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* Mold.

Of dunging rye-graſs.

§. 71. Though I approve not of dunging French graſs, nor clover, for reaſons given in another place, yet it is proper to dung rye-graſs; for thereby the roots of it will tillow and mat the more on the ground, and will conſequently occaſion the greater deſtruction and ſuppreſſion of the couch-graſs.

Of CHALK and chalking LANDS.

§. 72. Pliny tells of the cuſtom of the Britons to chalk their lands to great improvement, which, he ſays, laſted their lives. lib. 17. c. 8.

Different opinions about chalking.

§. 73. It is ſaid in general, that chalking is better for the father than the ſon; however, others agree, it is as good an improvement for twenty years as dung; and that the clay-land has been always the better for it.

Chalk not to be ploughed in deep.

§. 74. Farmer Farthing, farmer Wey, and divers others of the Iſle of Wight, all agreed, that chalk ſhould not be ploughed in too deep, but kept above ground as long as poſſible; for it would be apt enough of itſelf to ſink down and be buried; on which farmer Farthing took occaſion to ſay, that Col. Flemming, in moring and grubbing up wood, had to his knowledge found whole beds of chalk, an half ſpit thick, half a yard or near a yard deep in the ground, which, without doubt, was nothing elſe but the chalk laid in the ground before it was made coppice; for the chalk was of that nature, that it would ſink downwards till it became a bed of chalk: to this they all agreed, but ſeemed to talk of it, as if it ſunk in whole bits and pieces; but I told them, the truth of the caſe could be no other than this; the rain waſhed continually the chalk off by a white water, the ſediment of which, when it came to the clay, there ſettled, and became a vein or bed of chalk, and then ſettled into a ſolid body; but in that ſolid body it never did ſink, for that was impoſſible: chalk, however, by being ploughed in, without giving it time to waſte, may perhaps be turned down and buried too deep, and being laid at the bottom of the furrow may not be ploughed up again.

How chalk improves land.

§. 75. Chalk is not an improver to land in the ſame way as dung, which gives virtue to the land, and improves it by a fat, ſalt, nitrous quality, and by communicating to it the very principles of vegetation; but chalk is rather an improver to land, as it is a great ſweetener to ſour land, but more eſpecially as it opens the pores and particles of the land, and enables it to give up all it's ſtrength, even till it is a caput mortuum; ſo that chalk is not like dung, rich in it's own nature, but only mellows the land, ſo as to looſen the parts, thereby enabling every particle of it to communicate it's vegetative principle; for which reaſon, it is true, that land abuſed by over-ploughing after chalking, or ploughed as long as it would carry corn, will be laid down to graſs in a poorer condition than land can be when only dunged; for it is almoſt impoſſible to draw out the goodneſs of ſuch land, inaſmuch as without chalk 'tis impoſſible to looſen it's parts, and unlock every clot, to let it's virtue fly out; ſo that, properly ſpeaking, chalk is rather a midwife to deliver the land of it's fruitfulneſs, than what gives the fruitful principles of vegetation to it.

Chalk improves moſt the land that lies fartheſt from it.

§. 76. Chalk is commonly the greateſt improvement of thoſe lands that lie fartheſt from it; becauſe the lands that lie near it, partake and have too much of the nature of the chalk in them: they commonly lay twelve or fourteen loads of chalk upon an acre, where they lay it ſingle, which will upon ſome lands cauſe extraordinary crops of corn for fourteen or fifteen years together; and, where 'tis laid on graſs-grounds, it will not ſo much increaſe the bulk of it, as it will make the graſs ſweet, ſo as to cauſe cattle to fat ſpeedily, and cows to give thick milk. J. Mortimer, Eſq; F. R. S. fo. 70.

In the Iſle of Wight they ſometimes lay twenty-five waggon loads of chalk on an acre; their chalk is of a fat ſoapy kind, and they call it marle. The farmers in the hundreds of Eſſex bring their chalk as far as from Graveſend, but lay not ſo much on an acre by half as thoſe in the Iſle of Wight.

Chalk, when to be laid on the ground.

§. 77. If chalk be dug out of the pit, and lie a ſummer before it be ſcattered, it will be ſo hardened and dryed, that it will not eaſily ſlat or diſſolve; therefore it ſhould be dug at the beginning of winter, and laid on the ground forthwith; it cannot however be ſo well carried in winter, the days being ſhort, and, being more fat and clammy at that ſeaſon, you cannot load it ſo faſt as in ſummer.

Chalk, an improvement to hot light land.

§. 78. Mr. Worlidge in his art of gardening, fo. 13, ſays, that you may deal with chalky-land as with clay-land, tho' in a moderate way; for chalky-land is naturally cold, and therefore requires warm applications; it is alſo ſad, and will the better bear with light compoſts, which is the reaſon that chalk is ſo great an improver of light, hot, and dry grounds, eſpecially having ſuffered a calcination.

Chalk ſinks thro' clay, and vice verſâ.

§. 79. If chalk be laid on clay, it will in time be loſt, and the ground again return to it's clay; and if clay be laid on chalk, in time the clay will be loſt, and the ground return again to it's chalky ſubſtance. Many people think the land, on which the other is laid for a manure, being predominant, converts the manure into it's own ſoil; but I conceive in both caſes the chalk and clay is filtrated through the land on which 'tis laid by time, and, being ſoluble by rains into ſmall corpuſcles, is waſhed through the land on which 'tis laid; for neither of theſe manures is able to unite in it's fineſt corpuſcles with the corpuſcles of the land on which it is laid, ſo as to make ſo ſtrict an union and texture with it as the land doth with it's ſelf, and is therefore liable to be born downwards with rains, till no ſign of it be left.

Chalk on meadows.

§. 80. I was arguing with Dr. Heron how beneficial it was to chalk meadows, even in the hill-country: he aſſured me, that ſome of the notable huſbandmen of Woodhay in Hampſhire had told him, 'twas a common practice with tenants, three or four years before they left their farms, to chalk their meadows; whereby 'tis true they would for three or four years fling out a great crop of graſs, but then they would be much the worſe for it ever after;

and this ſeems to carry ſome reaſon with it; for the chalk ſo mellows and opens the pores of the meadow, that it enables the land to exhauſt it's ſtrength in all parts: for chalk does not carry ſo much fatneſs as dung does to the land 'tis laid on; but it diſpoſes the land to bear ſuch crops by it's ſweetneſs, and well diſpoſing of, and correcting an ill quality the land had before: but ſtill I ſee not that this is any objection to chalking of meadows, provided, whilſt by virtue of the chalk they are bearing ſuch burthens, you ſee they be refreſh'd with dung.

Id. and on paſture.

Though chalk laid on meadows enables them to give a great crop for three or four years, and will then impoveriſh them, yet I take it to hold quite contrary in paſture; for the graſs being thereby ſo much ſweetened and increaſed, keeps conſtantly ſo much the more ſtock, by which it is maintained always in the ſame vigor.

Chalk good for ſandy and clay land, and the reaſon.

§. 81. I do ſuppoſe that chalk laid on ſandy, or wood-ſeary ground laid up for paſture, may waſh and ſink in, and fill up the interſtices, and thereby conſolidate and mend the texture of ſuch ground, and ſweeten it, as it is a great alkali; and tho' by time moſt of the chalk may be waſhed downwards, ſo that the ground may loſe the virtue, yet I do ſuppoſe the ſtrength of the ground may ſtill continue much the better, by reaſon that ſuch manure having made the ſword of the graſs come thicker and ſweeter, the good paſturage on both accounts enlarges the quantity, and betters the quality of dung the cattle leave on it, which in return maintains a better coat and ſurface to the ground: and as chalk fills up the vacuities of ſandy, or wood-ſeary ground, ſo on the contrary, it inſinuates it's particles into obſtinate claiy and ſtrong land, and divides it, by making in a manner a ſciſſure, thereby hollowing and mellowing it; ſo the two contrary extreams are cured by chalk.

Chalk improves hop-clover and rye-graſs.

§. 82. Chalk laid on hop-clover and rye-graſs is a mighty ſweetener, and improver of thoſe graſſes, being laid upon it after harveſt, at the beginning of winter, or whenſoever one can beſt tend it; it will quickly ſhew the benefit, eſpecially if the ground be of a ſour clay, and apt to run to coarſe graſs.

Of LIME and liming LANDS.

§. 83. All ſorts of flints will make an extraordinary lime, but they are hard to burn except in a reverberatory kiln, becauſe they are apt to run to glaſs. Mortimer, fo. 70.

Of a lime-kiln and burning lime in Leiceſterſhire.

§. 84. December 9th 1699, I went to Gracedieu, and diſcours'd with the perſon who rents the lime-kilns of Sir Ambroſe Phillipps; and, two or three of his workmen being preſent, I with them took the meaſures of the kilns, which was 2 ½ yards high from the very bottom to the top, one yard lengthwiſe in the bottom, and two feet wide: they told me, that I muſt take care not to widen it too much at top, not exceeding two yards, by reaſon of the greater conſumption of coals; for the more gradual the widening is, the better: there was a layer of bricks run within ſide of the kiln, a-croſs, between the two vent-holes where they draw out the lime, for the better ſupport of the lime from tumbling down too ſoon. They burnt with culm, or coal-ſlack, which they accounted as well, or better than the other coal, and coſts but 1 s. per load, whereas the fine coal would coſt 6 s.—The kiln had five air-holes, two on each ſide of the bottom, and two on each ſide of the top, and one in the middle, of about a brick thickneſs wide; the ſtone is very hard, and they ſaid, three quarters of coal would only burn ſeven or eight quarters of lime; the larger the kiln the more profitable. There was a ſtone that laid the length of the kiln to keep up the walls from falling: the wall of the kiln againſt the bank was but the thickneſs of a brick, but the oppoſite ſide a brick length in thickneſs. This kiln would burn twelve quarters of lime in twenty-four hours.

Id. in the Iſle of Wight.

Farmer Farthing, (of the Iſle of Wight) when I view'd his lime-kiln, told me, I muſt not ſet up a kiln to burn above eighty quarters at a time; he burns but ſixty; that the kiln muſt be made to belly like a ſtone-mug, that the flame may be beat down by the narrowneſs of the top, and check'd from flying out too faſt. The kiln will be two days and two nights burning. The chalk muſt be arch'd over the fire like an oven, and carefully laid, leſt it tumble in.—In his kiln, to burn ſixty quarters he uſed to conſume two hundred furze-faggots; but now, as a great improvement in the price of liming, he uſes peat in heating the kiln, and furze-faggots afterwards, and can heat his kiln with two thouſand of peat, and burn it off to lime with five hundred furze-faggots. Of their country peat, he ſays, one may bring a thouſand in a waggon. Note, the deſign of the peat (being a ſlack fire) is only to dry the marle or chalk by degrees, in order for the furze-faggots to burn it off to lime; for if the fire be not ſlack and gentle, the chalk or marle drying too faſt will fly, and the arch with the chalk fall down; therefore when they uſed all furze-faggots, and no peat, he uſed not to put the furzes at firſt into the oven of the kiln, becauſe the fire would then be too fierce, but only put the ends lighted to the mouth of the oven, and ſlack'd the fire as he ſaw occaſion, by it's beginning to fly, which was a great trouble, and made a great waſte of the furzes, whereas the peat is all put into the oven. When the kiln is fit for the furzes to be lighted, one may try by ſeeing whether the marle or chalk will bear their blazing without flying, and, when the furzes are ſet on fire, one may know when the lime is thoroughly made by the flame iſſuing out at top; for the flame will break out of the kiln for three or four hours red; but when the topmoſt chalk is lime (and then of courſe the undermoſt is ſo) the flame will be pale, like the flame of a candle. He thinks what I make lime of, being chalk, and not a chalky marle, as theirs is, may be perfected with leſs fuel than theirs, which is of a moiſter nature.—As ſoon as ever it is burnt he carries it out, and, when it is ſlack'd, ſpreads it. It muſt be carried out, tho' never ſo wet, otherwiſe it will give with wet weather, and run together to a plaiſter, that it cannot be dug up without great difficulty with mattocks; this muſt be done, tho' it is very troubleſome to remove it in wet weather; for it will burn the mens hands, and bliſter them. He lays a buſhel and half on a lugg-a lugg-ſquare, which is about thirty quarters on an acre. It muſt be ſpread the firſt ſtill day, as ſoon as ſlack'd, and very carefully, for in the true ſpreading of it is a great advantage, and ſtirr'd ſhallow in.—Two men muſt attend the burning, who have each 12 d. per day, and 12 d. per night, and victuals:—the man who lays the chalk in has 2 s. 6 d. for doing it.— Quære, If bean-ſtalks well dry'd may not make a fire almoſt as good as furze.—I was afterwards telling Mr. Thomas Beach in Wilts, that I thought the way of burning lime with peat was not practicable with them, becauſe they made it of a hard ſtone, which the peat could not work on: but he ſaid, he was of another opinion; for in the north, he knew very well, they burnt the iron-oar, and melted it with peat; therefore he was ſure, 'twould be a fire ſtrong enough to burn the lime-ſtone.—Four or five hundred faggots leſs will burn a kiln, where the chalk is dry; therefore it is of conſequence to have your chalk dug a week before, that it may dry.

Lime to be plough'd in as ſoon as flatted.

§. 85. Morris, my tenant in the Iſle of Wight, and brick-burner, who came to burn lime for me, aſſures me, that in the iſland they have tried all ſorts of ways of burning lime, and uſing it; and that by experience they have found it the better way, when they have covered the heaps of lime with earth, to plough it in, and ſpurn or ſpread it immediately as ſoon as it is flatted fit for ſpurning, rather than to let it lie long covered with the earth in heaps; and that the beſt way of all, they have found, is, not to carry it out into the field till the third earth that they plough for ſowing their wheat, and then on the firſt flatting they have ſpurned it; and, tho' the ploughing-in in ſuch caſe has burnt the hair off their horſes heels, yet it has not hurt the wheat, but they have then had the beſt wheat.--Note, I do judge the letting the lime lie in heaps, mixt with heaps of earth, for a long time, in Somerſetſhire, &c. is becauſe the fallows will not work fine enough without being long expoſed to the ſun, and, if ſo, the lime would not be well diſperſed, to the great diſadvantage of the ground; but, in lands working mellow, I am of Morris's opinion.

Sign of good lime.

§. 86. I burnt a kiln of lime to a greater degree than ordinary, ſo that the bricks were all glazed, and in making and wetting up the lime I particularly obſerved the water, as ſoon as flung on, to boil and dance more than ordinary, and the lime to heave more, and in bulk the mortar (tho' the content of lime in buſhels was the ſame) was much bigger: I obſerved it to the maſons, who ſeemed much pleaſed with the goodneſs of the lime.—On which one of the labourers obſerved, that the caſe of lime was the ſame as of bread-corn; for as the drier the wheat is, the flour of ſuch corn takes up the more water, and plimbs the more, and makes more bread in bulk, both lighter and hollower, (whereas the flour of cold damp wheat heaves not with the water, drinks little water, and makes heavy bread) ſo my lime, being higher burnt, took more water, plimb'd into a greater bulk, and would be mellower and lighter under the trowel; and ſo all the maſons agreed.

§. 87. When I told a gentleman, uſed to lime burning in Wiltſhire, that in the Iſle of Wight they uſed to burn off a kiln of eighty quarters of lime at a time, he wondered at it; ſaying, how could they be aſſured to get it out before a rain came, for I, that burn but a little, am forced to get a cover to keep out the rain, leſt the lime when made ſhould by a rain fall into plaiſter.

Stone lime the beſt.

§. 88. Slack-lime cannot be ſo beneficially laid on land as ſtone-lime; becauſe a greater virtue muſt be attributed to the ſtone-lime for it's burning quality after it is laid on.

Lime not ſo good for meadow and paſture as for arable.

§. 89. Lime being laid on meadows or paſtures ſlacks and cools by ſlow degrees, ſo as not to undergo ſuch a heat and fermentation, as when it is covered with the hillocks of earth flung up in arable; therefore it cannot be of that great advantage to paſture.

Salt of lime extracted by water commended.

§. 90. Worlidge ſays, fo. 242. A mixture of lime is very good in moſt grounds; but the ſalt of limes extracted by water, and your ground watered therewith, is much to be preferred: it hath alſo this ſingular property, that it makes the worms ſoon leave the place ſo watered.

Quantity of lime on an acre.

§. 91. In Wiltſhire they lay twenty-four or thirty quarters of lime on an acre, as the ground is.—But at Winterhays, and thereabouts in Dorſetſhire, they never lay above twenty hogſheads on an acre, every hogſhead is four buſhels.—The lighter the land is the more lime it will require, the ſtronger the leſs.

When to ſcatter lime on wheat and barley, and what quantity.

§. 92. In Leiceſterſhire they ſow or ſcatter the lime on wheat-land when they ſow the wheat, but on barley-land the laſt earth ſave one; and ſo plough it in, leſt, if they ſhould ſow it with the barley in the ſpring, it might burn it. They lay five quarters on an acre of each, according to the meaſure as it comes from the kiln, for after it is ſlack'd thoſe five quarters will near make ten.

Time of liming land.

§. 93. Liming of land being to bind it, it ſeems to me, land ſhould not be limed late in the year, no more than building ſhould go on then; becauſe, the land being then cold and moiſt, and but a weak ſun to conſolidate it, the end of liming is loſt; for if it conſolidate not at firſt liming, it will not afterwards.

Of ſcattering lime.

§. 94. Farmer Wey and others ſay, in the Iſle of Wight they have a practice (which is the eaſieſt way, in caſe a buſhel of lime be laid in a lugg-ſquare) when a buſhel of lime is laid down, and the cart going, to tie a piece of leather to the ſpoke, and when that goes juſt round, it meaſures a lugg; for the compaſs of a cart wheel is a lugg, that is 16 ½ feet: and, if you would lay it in a lugg and half, you may manage it accordingly.

Price of liming.

§. 95. Mr. Taunton of Dorſetſhire, in form of a bill for work, gave me the following account of the method and prices of liming; (the prices I think extravagant) viz. For covering an acre of lime, 1 s. 8 d.—Covering is when the lime is firſt laid on the land, it may be a peck in a place, and ſo covered over with earth.—For turning an acre of lime, 2 s. 6 d.—Turning is mixing the earth and lime together.—For ſpurning an acre of lime, 2 s. 8 d.—Spurning is throwing it abroad on the earth juſt before ſowed.—For hacking an acre of lime, 1 s. 6 d.—Hacking is breaking the clots abroad after 'tis ſown.—For ſhoveling the furrows of an acre of lime, 8 d.---Shoveling is the cleanſing the furrows, and throwing it on the land.——9 s. per acre.

§. 96.

§. 96. I aſk'd Mr. Clerk about the method of liming about Loughborough; he ſaid, they laid on their grounds they laid up to graſs forty buſhels per acre about the beginning of October, and on their arable lands the ſame meaſure; their way is, as the cart goes along the ground, to fling it over with ſhovels, and to ſpread it thin. It ſeems it has been very hurtful to their graſs-ground in rotting their ſheep in wet years; for it has proved the graſs ſo faſt, as to rot the ſheep.—I ſuppoſed the lands were ſubject to rot before, or elſe the lime would not have ſubjected them to it; but Mr. Clerk ſaid, no, that the lands were high up-land downy grounds, never ſubject to the rot before; and that many men in that country had proved it to their ſad experience; and, ſince they had found it, their way was to remove ſuch ſheep in a wet ſummer out of ſuch grounds, and put others in. Note, the lime in this country is ſtrong: Mr. Cheſtlin is of the ſame opinion.

Method of liming in Leiceſterſhire.

Hurtful to their ſheep.

Mr. Cheſtlin of Leiceſterſhire ſays, he pays but 12 d. per quarter for his ſtone-lime, and fetches it two miles; he lays fifty buſhels on an acre, becauſe his is colder moiſter land than his neighbours.---He ſays, as it binds ſandy ground, ſo it mellows and ſlats cold and clay-land. He can with a dung-pot and two men ſhovel it on about an acre and half per day. He ſays, he has had a ſill-horſe's black coat burnt red with it; if it be wet weather when they ſpread it out of the dung-pots, they cover their horſes with old hammock-cloths, and yet it will burn them very much.---Mr. Bowly ſays, he never lays above forty buſhels on an acre, but that forty when ſlack'd will be near eighty; if it lies out in the weather any little time, to have the dews or a ſhower of rain, it will ſlack of itſelf, but if they fetch it and lay it on their grounds directly, then they ſlack it with water.---He thinks lime ſhews not it's full ſtrength and power till the third crop. One may over-lime; for where the lime is laid in heaps in the field before ſpreading or ſpurning it, there will ſeldom grow any corn for a year or two.---He ſays, they generally ſow the lime on the ground, and then the wheat, and then turn it in under furrow; but in ſowing it with barley, they generally ſow it the laſt earth ſave one, and turn it in, and then give the laſt earth for ſowing the barley; but, if they ſow with a wheaten crop, and then lay down to graſs, they ſow the wheat on the plough'd land, and harrow it in, and then ſow the lime, and harrow it in, in order to lay it down ſmooth to graſs; for if they ſhould harrow the lime in firſt, and ſow their wheat, they would not in the ſecond harrowing it be able to bury it, the ground would be ſo fine.

§. 97. A very underſtanding huſbandman of Shropſhire coming to me at Sir Ambroſe Phillipps's, I aſk'd him, whether his was as deep a country as Leiceſterſhire; he ſaid, it was. I aſk'd him, if they uſed liming; he ſaid, they did, and, on enquiry, I found the method in all reſpects agreed with the Leiceſterſhire manner, ſaving that they laid dung and lime together, viz. about twenty load of dung, and but twenty buſhels of lime on an acre. In the wheaten crop they ploughed in the dung the laſt fallow before ſowing, and before the ſowing the wheat ſowed lime.---They fetch'd the lime fourteen miles on horſes backs, becauſe in their deep country the carts could not

Method of liming in Shropſhire.

ſo well go: it was a ſtone-lime, not a chalk. He ſaid, it coſt at the kiln 3 d. per buſhel, therefore with the carriage it muſt be very dear.

Of over-ploughing after liming.

§. 98. I deliver it as a rule to all huſbandmen to be cautious of liming ground, and then ploughing out the heart of it. I limed ſome years ago in Wiltſhire ſeven acres for an experiment, and laid down one acre to it's own natural graſs in two years time, the graſs of which is to this day worth 40 s. an acre. The third year I laid down another acre, which is to this day worth 30 s. per acre. The reſt I ploughed five or ſix years farther, which is not worth fifteen groats per acre. The like experience I have had in burn-beaking ground.

Of harrowing the ground fine before liming.

§. 99. Farmer Farthing, farmer Wey, and F. Loving of the Iſle of Wight, told me, that if, after I fallowed, before I plough'd my lime in, I dragg'd or harrow'd the ground fine, the lime would mix much the better with the earth, and it would anſwer that charge very well.

Lime good for ſandy ground.

§. 100. If we try the experiment, we ſhall ſoon find it very viſible, that lime agrees with ſandy ground by it's binding quality; and the like obſervation may be taken from the mortar commonly made of theſe two ingredients[s].

Of

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[s] Of liming from Mr. Duhamel, a French author. Vol. 3d. edit. 1754. p. 48 to 57.

Lime is uſed chiefly on freſh broke up lands; after having plough'd them up not very deep, they lay on the lime in the manner following.

They carry on the lime as it comes from the kiln; and lay about one hundred pound weight in a heap on every ſquare perch; ſo that the heaps lie at a perch diſtance one from another; then they raiſe the earth all round the heaps in form of ſo many baſins; the earth that forms the ſides of theſe baſins ſhould be a foot thick; and laſtly, they cover the heaps, half a foot thick, with earth, in form of a dome. The lime ſlacks under this covering of earth, and is reduced to powder; but then it increaſes in bulk, and cracks the covering of earth; if you do not carefully ſtop theſe cracks, the rain will inſinuate itſelf, and reduce the lime into a paſte which will not mix well with the earth, or make a ſort of mortar, which will not anſwer the end propoſed. The farmers therefore are very careful to examine the heaps from time to time and ſtop the cracks: ſome only preſs the top of the heaps with the back of a ſhovel; but this practice is ſubject to an inconvenience, for if the lime is in a paſte within the heap, by this means you beat it ſo together that it will not eaſily mix with the earth; wherefore it is better to ſtop the chinks by throwing ſome freſh earth over the heap.

When the lime is thoroughly ſlack'd, and reduced to powder, they cut the heaps with a ſhovel, and mix the lime as well as poſſible with the earth that covered it, and then having thrown it up in heaps again, leave it expoſed to the air for ſix weeks or two months; for then the rain will do no harm.

About the month of June they ſpread this mixture of lime and earth upon the land; but not all over as may happen; on the contrary they take it up by ſhovelfulls, and diſtribute it in little heaps at equal diſtances on each perch of land: they obſerve that theſe little heaps promote vegetation more than if it was ſpread uniformly all over the field, and they don't mind leaving little intervals unlimed between each ſhovelfull. Afterwards they plough the field, for the laſt time, very deep: then towards the end of June they ſow buck-wheat, and cover it with the harrow, and if any heaps remain break them with a hoe.

Buck-wheat occupies the land about one hundred days; ſo that this grain ſown about the end of June is gathered about the end of September.

When the ſtalks and roots of this plant are dead and dried, they plough it up, and immediately ſow wheat and cover it with the harrow.

About the month of July or Auguſt, after the wheat crop, they plough as ſoon as poſſible; they plough for the laſt time in February or March in order to ſow oats, or in April for barley, but in this caſe they ſtir the land two or three times to make it fine.

They

Of BURN-BEAKING.

Not to over-burn the turf.

§. 101. Worlidge, fo. 234, ſays—In the burn-beaking of land the ruſtic obſerves, that over-burning the turf is injurious, and that a more moderate burning makes the ground more fertile. The reaſon is plain; for in the burning any vegetable, a gentle, eaſy, and ſmothering fire doth not waſte the volatile nitrous ſpirit ſo much as a quick fire would do, and cauſeth more of it to fix and remain behind.

Of burn-beaking moſſy ground.

§. 102. Where much long moſs grows thick, tho' the ground be never ſo ſandy in it's nature, yet the ground underneath muſt be of a moſt cold and ſour nature by being kept from the ſun, and the wet more ſogging in it than if it had been ſolid earth upon it; for nothing retains water longer than ſuch a ſpungy body, nor breaks the rays of the ſun more from penetrating. Therefore ſuch ground ought to be burn-beak'd, or the moſs harrowed up before ſeeding, and burnt in heaps, but rather burn-beak'd to deſtroy the ſeeds.

§. 103. Quære, in burn-beak'd ground what weeds or plants appear the firſt year, becauſe, according to Mr. Bobart of the phyſic garden at Oxford, their ſeeds are deſtroyed; only ſome few may be ſuppoſed to have lain deeper than the fire went into the earth [t].

PLOUGH

They harrow in all theſe different grains, and when they are come up they paſs a roller over the oats, and if there remain any clods in the barley they break them with a hoe.

The next February or March they ſow grey peas or vetches.

After the harveſt of theſe pulſe, they give one or two ploughings to prepare the land for wheat the enſuing autumn.

The year after they ſow oats mixt with clover, and then lay it down to paſture for three or four years.

In ſome new broke up lands they ſow no buck-wheat, but let it lie fallow from the month of March when it was firſt broke up, till October, when they ſow it with wheat; making uſe of the intermediate time to give it ſeveral ploughings; theſe lands by this means being much finer, they uſe little more than three fourths of the quantity of lime above preſcribed, and generally have a better crop than when they begin with buck-wheat.

Some farmers think a perch too great a diſtance for the convenience of ſpreading the lime; therefore they make the heaps leſs, and increaſe the number in proportion. Being perſuaded that lime is moſt efficacious when near the ſurface, they firſt plough it in, and then give it a ſecond ploughing before they ſow, by which means the lime lies chiefly near the ſurface.

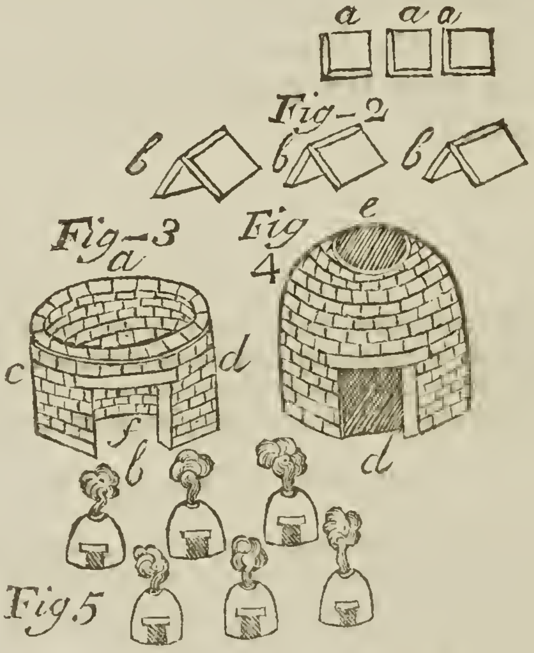
Others lay the lime in a ridge from one end of the field to the other; this diſpoſition is the leaſt trouble to ſpread.

[t] The following is an extract from Mr. Du Hamel's account of burn-beaking in France, which I have here inſerted, hoping it might be of uſe to the reader.

PLOUGH and CART-TACKLE.

Of different kinds of ploughs. §. 1. MR. Baily (who had many times ſet his own hand to the plough, and got 200 l. per annum, from a ſmall beginning by it) and I were talking about the different varieties of ploughs in different countries, and I aſked him, wherein he thought a two-wheel plough had the advantage of a foot plough, or a plough without wheels. He ſaid, he knew of no other uſe of a two-wheel plough, but that the ploughman could keep it more ſteady in ſtony-lands, ſo that every jolt ſhould not fling it out of it's work; for it ſtands to reaſon that the wheels cannot be ſo eaſily joſtled off, as the plough might be without wheels; for the outward wheel goes in a ſeam, and is kept

Fig. 1.



Of BURN-BEAKING.

Page 75—83. With regard to lands which are ploughed up but once in eight or ten years, it is the cuſtom to burn them, to the end that the fire may divide the particles of the earth, and that it may be fertiliſed by the aſhes of the roots and leaves. This is the method of the operation.

They raiſe the ſurface with a hoe or crooked pickax, the iron of which is very broad and thin, cutting each turf as regular as poſſible in the form (a. a. a. fig. 1.) about eight or ten inches ſquare, and two or three inches thick.

As ſoon as theſe turfs are cut, they employ women to pile them one againſt another, with the graſs ſide inward in the manner (b. b. b. fig. 2.)

When the weather is fine, the air will dry them, in a couple of days, ſufficiently for making the furnaces and burning them; but, if it ſhould prove rainy, you muſt be careful to turn the turfs, for they muſt be well dry'd, before you make the furnaces, of which we are going to ſpeak.

In forming the furnaces, they begin by raiſing a ſort of cilindric tower (a. b.) of * *one foot* diameter (c. d. fig. 3.) as the walls of this little tower are made of the turfs, their ſize determines the thickneſs; but kept in by the whole land; for the ſame reaſon, in hill-country-lands, where one ploughs along the ſide of a hill, any jolt would be apt to lift a plough without wheels out of it's furrow towards the declivious ground.—I aſked him, wherein he conceived the advantage of a plough with one wheel to conſiſt: he ſaid, in the ſame points as the former; he knew of no other reaſon for uſing them.

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* This muſt be a miſtake, I ſuppoſe three or four feet may be a convenient ſize, as may be judged from the figure.

§. 2. In

but in building them they always lay the graſs downwards, and they make a door on the windward ſide, of a foot wide.

On the top of this door they lay a large piece of wood, which ſerves as a lintel. Then they fill all the inſide with ſmall dry wood mixt with ſtraw; and finiſh the furnace by making a vault of the ſame turfs, like the top of an oven.

Before the vault is entirely finiſh'd, they light the wood that fills the furnace; then they quickly ſhut the door (d.) with turfs, and finiſh by ſtoping the opening (e. fig. 4.) which was left at the top of the vault; taking care to lay turfs on all the places where the ſmoke comes out too plentifully, exactly as the charcoal-makers do; for without that precaution, the wood will conſume too faſt, and the earth be not ſufficiently burnt.

If you cover the furnaces with earth, all the crevices being too cloſely ſtop'd, the fire will be extinguiſhed; but, as you uſe only turfs, and always put the graſs downward, there is air enough to keep the fire burning.

When all the furnaces are made, the field ſeems covered with little hay-cocks ranged in quincunx's (fig. 5.) but you muſt watch the furnaces till the earth is red hot; to ſtop with turfs any cracks that may happen; to repair ſuch as may be in danger of falling, and to light again ſuch as may be extinguiſhed. When the earth ſeems all on fire they want no further care; even rain itſelf, tho' before much to be feared, will not hinder their being ſufficiently burnt; ſo you have nothing more to do but to let them go out of themſelves.

At the end of twenty-four or twenty-eight hours, when the fire is extinct, all the heaps are reduced to powder, except ſome of the tops which will remain not ſufficiently burnt, they not being enough expoſed to the action of the fire; and 'tis for this reaſon that we adviſe not to make the furnaces too big, becauſe, the walls being proportionably thick, the turfs on the outſide will not be done enough, when the inſide is over-done; for if you burn them like bricks it will not be fit for vegetation. Beſides, in making large furnaces you will have too far to carry the turfs. You might even make them leſs; but that would conſume too much wood: thus you will find it neceſſary to conform pretty near to the proportions we have preſcribed.

When the furnaces are cooled, they wait till it rains, and then ſpread the burnt earth as even as poſſible, leaving none on the ſpots where the furnaces ſtood, which nevertheleſs will produce finer grain than the reſt of the field, for which reaſon they leave only ſuch turfs as are not burnt enough on thoſe ſpots.

They immediately plough it very lightly, to begin to mix the burnt earth with the ſurface; but they go deeper in the following ploughings.

If you can give the firſt ploughing in June, and rain follows, it is poſſible to reap ſome advantage from the land immediately, by ſowing turnips, radiſhes or millet; which will not prevent your ſowing wheat or rye the autumn following.

Nevertheleſs it is better to loſe the advantage of ſuch a firſt crop, that you may have the whole time to prepare the land well for the reception of wheat.

Some chooſe to ſow rye rather than wheat, becauſe the firſt production being very vigorous, wheat is more apt to be laid than rye.

Some do not ſpread the burnt earth till juſt before the laſt ploughing for wheat; they content themſelves with ploughing well between the furnaces, which they take care to ſet exactly in a line, in order to leave a free paſſage for the plough. But this is a bad method; for, ſince wheat is always apt to be laid the firſt year after burning, it is better to ſpread the burnt earth early, before it loſes part of it's heat, and for the convenience of well preparing the land; for it is very material that the burnt earth ſhould be perfectly well mixt with the ſoil.

It muſt be owned that this method of burning is very expenſive, becauſe the labour muſt be performed by men, and that it conſumes a great deal of wood; but it is very advantageous, for after this ſingle operation, the land is better prepared than it would be by many ploughings.

Of proſciſſion.

§. 2. In the Iſle of Harries, &c. the way of tillage is commonly by ploughing, and ſometimes by digging; the ordinary plough is drawn by four horſes; and they have a little plough there commonly called a riſtle, i. e. a thing that cleaves, the coulter of which is in form of a ſickle: it is drawn ſometimes by one, and ſometimes by two horſes, according as the ground is: the deſign of this plough is to draw a deep line in the ground, to make it more eaſy for the great plough to follow, which otherwiſe would be much retarded by the ſtrong roots of bent lying deep in the ground, that are cut by the little plough: the little plough is uſed alſo to facilitate digging as well as ploughing. Martin, fo. 54.——This was alſo a common method uſed amongſt the Romans, where the ſoil would allow of it. But it ſeems not practicable in ſtony and flinty lands, but without doubt in deep lands is good huſbandry, and enables the ploughman to turn up the fallows in an exact and beautiful manner: I wonder theſe barbarous Iſlands ſhould have it in uſe, and not we in England [a]. [b] The Romans in rich ground, that was apt to detain the wet, uſed this cutting plough, or what they called proſciſſion, in ſpring, after the weeds were all come up, and before the ſeeds were ripened.

Of the ſorts of iron uſed in plough-tackle.

§. 3. I find in Leiceſterſhire they uſe Daniſh iron in all plough-tackle and horſe-ſhoes, except the coulters and the plough-ſhares, which are Engliſh iron. They hold the Daniſh iron to be more durable, and tougher than the Engliſh iron, which they cannot work ſo well, as being much brittler, and wearing faſter: they can in Leiceſterſhire afford the Daniſh as cheap as the Engliſh iron.---I aſked the Loughborough ſmith, if Daniſh iron would make wheel-tire, he ſaid care muſt be taken that the ſmith puts not in iron rank with ſteel, for then 'twill break preſently; but by breaking a bar before 'tis uſed the ſmith will know it.

Agree with the ſmith by the great.

§. 4. It is much the intereſt of a gentleman to agree with the ſmith for his plough-irons by the great; for it is impoſſible ſuch a perſon ſhould watch his ſervants, ſo as to ſee that they ſent to the ſmith ſuch ſhares and coulters only, as were worn out, or to take an account how often; whereas ſervants are apt before there is occaſion, or the irons are worn out, conſulting their own and their horſes eaſe, to ſend them to the ſmith, who ſets down the ſame price as if the irons had been quite worn out: ſo that if ſervants and ſmith be left to themſelves, irons ſhall come again no better than they were when they were ſent.

On keeping the irons in order.

§. 5. The better order you keep your irons in, the eaſier it is to the man that holds the ſull, and the eaſier to the horſes that plough: the longer the point of your ſhare is, the more ſteady does it go, and carries an evener furrow.

Of keeping a ſpare coulter and ſhare.

§. 6. I take care to have a ſpare coulter and ſhare always by me, which is in readineſs, whilſt the worn-out one might be ſent to the ſmith to be new pointed; and this I do, becauſe I expect the ſmith himſelf, and not his man, ſhould have the pointing of it; for I depend on him for the well hardening it, which could not be, if I ſent the worn-out one over night to have it the next morning; I muſt then take who could be found, either maſter or man. Add alſo, that ſuch coulter will be much the harder for lying by two or three days before uſed.

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[a] See Pliny fo. 294, 295.—Pallad. fo. 94 to 98.—Varro, book 1ſt, fo. 37. Of proſciſſion.

[b] Pingues campi, qui diutius continent aquam, proſcindendi ſunt anni tempore jam incaleſcente, cum omnes herbas ediderint, neque adhuc earum ſemina maturuerint. Columella, lib. 2. fo. 99.--Of ſeveral new invented ploughs and their conſtruction. See Mr. Tull's book of horſe-hoeing huſbandry.

§. 7. To put old iron bands on new wheels is very ill huſbandry, for the wood muſt neceſſarily wear out preſently, the iron not being broad enough to ſave it.

Old iron bands on new wheels ill huſbandry.

§. 8. An old Nottingham ſmith told me, it was much the durableſt way to turn up the edges of the bands to wheels, which adds to the thickneſs of the edgings, and is the main ſecurity to the bands; for in the edgings they wear away firſt; but, for their own intereſt, wheel-wrights will pretend there is no advantage in it; yet where the edgings are not turned up, in the uſing the edges ſhall be worn away, and the fillies ſo worn, that the ſpokes ſhall be ready to ſtart out of their ſockets, when the timber in other reſpects ſhall be very ſound. The ſmith ſaid, the making them ſo was a penny in a ſtone difference to him.

Of making the bands to wheels.

§. 9. Note, for fillies, aſh that will ſplit is with us thought fitteſt, and much the ſtrongeſt; but the arms of an aſh-tree are commonly put in, if they be not too frowe, and they muſt be ſaw'd, and the body of an aſh likewiſe if it be knotty; becauſe, that will not ſplit; yet, becauſe ſuch fillies are ſaw'd croſs the grain, they are not like to be durable.

Split aſh good to make fillies.

§. 10. Farmer Farthing, Wey, and Loving, of the Iſle of Wight, all aſſure me, that elm fillies are beſt for wheels, eſpecially in deep ways, where the waggon ſways, and only ſuch they uſe in the Iſle of Wight; for they will not crack with the nails being drove into them, as the aſhen will; but we at Crux-Eaſton, &c. uſe only aſhen ones; but I ſuppoſe the reaſon is, becauſe elm grows not in the hill-country, and I the rather think ſo, becauſe below the hill, where elm grows, they all uſe elm fillies.

Elm good for fillies.

§. 11. If the farmers boarded their waggons in Hampſhire, as they do in Hertfordſhire, the price of the boards would be gained in one harveſt by ſaving the droppings of the corn.

Of boarding waggons.

§. 12. It is found by experience, that tying the ſide-boards to the raths of the waggon with leather thongs greaſed, is much better and more laſting than nailing them, becauſe the heads of the nails are continually breaking out by the ſhaking of the waggon, &c.

Of tying on the ſide-boards of waggons.

§. 13. It is a vaſt damage waggons receive in winter by lying abroad: when they are wet the froſt cracks the wood.

Of houſing waggons.

§. 14. Every body grows weary of chequer-harneſs; for tho' it looks pretty at firſt, yet it ſoon flies to pieces: chequer-harneſs is that which is work'd up with thongs.--The cheapeſt way is to work up the harneſs at ones own houſe; the harneſs-maker has but 1 s. per day and diet, you finding the ſtuff; in ſuch caſe you muſt provide three or four bull-hides two or three years before, and put them out to dreſſing to the collar-maker; the dreſſing com-

Of harneſs, and the cheapeſt way of making it.

commonly coſts as much as the hide is worth, be it bigger or leſs; when hides hold a pretty good price, a ſmall bull's hide is worth 12 s. and it is common for the currier to dreſs one half for the other; when theſe hides are dreſs'd they'll take no harm for four or five years if kept dry, as ſuppoſe laid on the ground under the beds that lie on it; tho' it is ſaid that is rather too dry.—A bull's hide ſhould never be uſed by the ſhoe-maker, nor a cow's hide by the collar-maker, there being a ſtatute that provides in that caſe, tho' not ſtrictly obſerved.—A careful and good farmer in my neighbourhood keeps bull-hides always by him, and uſes them on all occaſions about his harneſs in mending it, unleſs for ſewing-thongs, and there, muſt be white leather, but otherwiſe the bull-hide is always beſt.—The common price for a horſe-hide undreſt is 5 s. and the dreſſing 5 s. If the eyes of the plough-traces are lined with leather, (which is good huſbandry, to ſave them from fretting out) ſuch lining coſts no more than hempen traces.

The halters and cruppers and back-bands ſhould be made of bull-hide, the belly-bands of heifer-hide, double-lined with horſe-hide; the fill-hangs of horſe-hide, the rigg-rope of white leather, that is, horſe hide; the pipes of the back and the collars of the belly of bull-hide.--If the leather be not well tawed, that is, dreſs'd thoroughly with allum and ſalt, it will have a raw black ſeam run throughout, which, when it grows dry, will be hard and horny, and crack in bending; whereas, what is dreſs'd kindly, is like buff, ſoft, and one may blow thro' it. Few harneſs-makers, that are white tawers, underſtand how to dreſs their hides, but have them of the glovers or felmongers, and ſuch can leſs anſwer for their goods. Such leather as is white tawed, is never tann'd: of my ſet of harneſs only the pipes and collars paſs'd through the tanner's hands. With good uſage they may laſt a dozen years, and wet weather will not damage them, if well dreſt, and made according to the above directions; but great care muſt be taken not to hang them againſt a plaiſter wall in the winter, that being the likelieſt way to rot and ſpoil them.

§. 15. The ſmith, carpenter, wheel-wright and harneſs-maker, may be ſaid to be the landlords of thoſe gentlemen who keep much huſbandry in their hands.

PLOUGHING.

Of pulveration.

§. 1. THE antient writers on huſbandry lay a very great ſtreſs on making the ground fine by frequent ploughings. [a] It is adviſeable, ſays Pliny, in ſtrong land, ſuch as we generally have in Italy, to plough five earths, but in Tuſcany nine earths; [b] and Virgil, adds he, is ſuppoſed to have preſcribed four earths, or two ſummer and two winter ploughings, by the rule he lays down in his firſt Georgic.

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[a] Spiſſius ſolum, ſicut plerumque in Italia, quinto ſulco melius ſeri eſt, in Tuſcis verò nono. Plin.

[b] Quarto ſeri ſulco Virgilius exiſtimatur voluiſſe, cum dixit optimam eſſe ſegetem, quæ bis ſolem, bis frigora ſenſiſſet. Plin.

> Illa ſeges demum votis reſpondet avari
> Agricolæ, bis quæ ſolem, bis frigora ſenſit.

[c] It was the conſtant maxim indeed among the Roman farmers, that they could not give their ground too much tillage; and, if a field required harrowing after the ſeed was ſown, it was a ſign, with them, that ſuch field had not been ſufficiently ploughed. Land, ſay their authors, eſpecially if it be of a rich nature, and that is apt to hold water, ought to be turned up ſo often, and reduced to ſo fine a powder, that the track of the plough-ſhare may hardly be diſtinguiſhable in it; for by this method the roots of all weeds will be torn in pieces, and deſtroyed.

Among the moderns Mr. Ray aſſigns ſeveral reaſons for making land fine [d] and mellow before it is ſown. It is beneficial, ſays he, that the nitrous particles of the air, which chiefly promote vegetation, may inſinuate themſelves more freely and in greater quantity thro' the cracks and interſtices of the land, and there be precipitated and adhere to it; perhaps the rain water alſo may be of uſe in diſſolving thoſe ſalts, which they carry with them into the pores of plants. Beſides, the water ſinks more eaſily thro' light looſe earth, ſo that the roots are in leſs danger of being ſuffocated by too much moiſture, or of being corrupted and killed by too much cold; and there is this farther advantage in it, that by letting the air more plentifully into the air-veſſels of the roots, it gives them a freer reſpiration, which we have already ſhewn is not leſs neceſſary to plants than animals.—Mr. Evelyn explodes thoſe, who fancy the turning and ploughing land frequently in the winter, before it is employed for a crop, cauſes it to exhale, and ſpend the virtue it ſhould retain, there being in truth no compoſt or lætation comparable to this continual motion: it evaporates the malignant halitus and impurities of the impriſoned air, laxing the parts, and giving eaſy deliverance to it's offspring. Theſe ſeminal ſalts and rudiments, wherever latent, are free to move and exert their virtue, when theſe chains and weights, which fetter and depreſs them, are taken off. He aſcribes more benefit to often opening, ſtirring, and ventilating the earth, than to dunging.

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[c] Malè aratur arvum, quod ſatis frugibus occandum eſt; id demum rectè ſubactum erit, ubi non intelligetur utro vomer ierit. Plin.--- Pingues campi, qui diutius continent aquam tam frequentibus denſiſque ſulcis arandi ſunt, ut vix dignoſcatur in utram partem vomer actus ſit; quandoquidem ſic omnes radices herbarum perruptæ necantur: ſed et compluribus iterationibus ſic reſolvatur vervactum in pulverem, ut vel nullam, vel exiguam deſideret occationem, cum ſeminaverimus; nam veteres Romani dixerunt malè ſubactum agrum, qui ſatis frugibus occandus ſit. Columel. lib. 2. fol. 99.

[d] Tum ut particulæ aeris nitroſæ, quibus præcipuè vegetatio promovetur, in terreni interſtitia liberius et copioſius ſe inſinuantes ibidem præcipitentur, et terreno adhæreſcant: quin et aquæ pluviæ fortaſſe ad ſalium ſolutionem conducunt, quos ſecum unà in radicum poros convehunt: præterea in terra laxa et ſoluta aquæ promptius ſubſidunt, adeoque nec humore nimio radices ſuffocant, nec frigore corrumpunt: præterea terra laxa et ſoluta ad hoc conducit, ut aer copioſior radicum tracheas ſubeat, ad reſpirationis uſum, quam plantis non minus neceſſariam eſſe quam animalibus oſtendimus. Ray, fol. 33.

But if to pulverize and grind the ground was the only end of ploughing, without any regard to the taking in the corporeal emanations of the ſun, a froſty winter fallow would chaſten the earth, and make it as fryable as a ſummer one; but the difference is vaſtly great; for the ſun improves the earth more than dung does.—As fire in lime, or burn-beaking, raiſes and fixes the ſalts, ſo does the ſun, which is a fire; therefore the more you let the ſun into the ground by ploughing, the greater the benefit.

In Aſia and the hot countries their corn does not burn up, but is able to come out of the ground, which in England it would not do, if we had their hot weather. This ſeems to be owing to the mighty fineneſs to which their ground is reducible by the plough, they having ſuch dry ſeaſons for fallowings and ſtirrings, whereby their ground falls much cloſer than ours, and does not gape by the heat, but, by reaſon of its mellow parts, drinks in abundance of the dews, which our land, leſs fryable, does not, and which dews, in great probability, fall more with them than with us.

The order of fallowing among the antients.

§. 2. [e] The method among the antients of ploughing from one tilt to another is laid down by Columella as follows: Lands that are inclined to be moiſt ought to be firſt broken up from about the middle to the latter end of April, and, after this firſt ploughing, to lie ſtill till towards the latter end of June, or about the time of the ſummer ſolſtice, when they are to be ploughed a ſecond time, and about the beginning of September they are to receive their third ploughing: but it is better to omit either or all theſe ploughings, than to turn up the ground, when it is wet and in mortar, or even when the upper part of it, after a long dry ſeaſon, has been wetted by ſudden ſmall ſhowers, which have not ſunk deep into it; for, if you plough up the ground when in a wet and dawby condition, there will be no meddling with it again for the whole year, but it muſt lie uſeleſs; and, if you plough it up when the ſurface only has been thus wetted, it will be barren for three years afterwards. The beſt ſeaſon for ploughing is, when the ground is in a moderate temperament, neither very wet, nor very dry; for by too much moiſture, as I ſaid before, it will cling together, and be like mortar, and, after a long drought, tho' a little moiſtened at top, the plough-ſhare will either not be able to penetrate it, and be continually thrown off by the hardneſs of the earth, or, if it ſhould penetrate it, it will not make it fine, but turn it up in large clods, which will be a continual hindrance to you at it's next ploughing, and at laſt be left unbroken and in lumps on the field. Add to this, that even in rich ſoils, the part that lies deepeſt is always the moſt barren.

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[e] Uliginoſi campi proſcindi debent poſt idus menſis Aprilis; quo tempore cum arati fuerint, diebus interpoſitis, circa ſolſtitium, quod eſt nono vel octavo calendarum Juliarum, iteratos eſſe oportebit: ac deinde circa Septembris calendas tertiatos: ſed quandocunque arabitur, obſervabimus, ne lutoſus ager tractetur, neve exiguis nimbis ſemimadidus, quam terram ruſtici variam, carioſamque appellant; ea eſt cum poſt longas ſiccitates levis pluvia ſuperiorem partem glebarum madefacit, inferiorem non attingit; nam quando limoſa verſantur arva, toto anno deſinunt poſſe tractari, nec ſunt habilia ſementi, aut occationi, aut ſationi: at rurſus quæ varia ſubacta ſunt, continuo triennio ſterilitate afficiuntur, medium igitur temperamentum maxime ſequamur in arandis agris, ut neque ſucco careant, nec abundant uligine; quippe nimius humor, ut dixi, limoſos, lutoſoſque reddit, at qui ſiccitatibus aruerunt, expediri probe non poſſunt, nam vel reſpuitur duritiâ ſoli dens aratri, vel ſiquâ parte penetravit, non minute diffindit humum, ſed vaſtos ceſpites convellit, quibus objacentibus impeditum arvum minus recte poſſit iterari: quo evenit ut in iteratione quoque ſcamna fiant. Accedit huc, quod omnis humus quamvis lætiſſima, tamen inferiorem partem jejuniorem habet. Columella, lib. 2. fol. 99.

Summer-fallowing, cauſe of the benefit of it.

§. 3. One great reaſon of a ſummer-fallowing's enriching all ground ſeems to me to be, becauſe the ſteams and vapours of the earth, which lie beneath the turf and furrow ploughed up, are, in the ſummer-time, conſtantly exhaling upwards, which being ſtopp'd and retarded by the furrow, and lodged in the caverns, are, after evaporation of the watery parts, by the fire of the ſun, digeſted into fixed ſalts; for the continuation of the channels or pores of perſpiration being broken by the furrow turned down, the effluviums are ſtopped, and fix, as againſt a cieling of a vault.

I ſummer-fallowed the one half of a field in May and June for wheat; the other half I ploughed in September for winter vetches: the winter after I could obſerve the half ſowed to vetches very much over-run with geranium columbinum, but the wheaten part had not the tenth part of that weed, notwithſtanding it's having been dunged for wheat. So much is owing to a ſummer-fallow, which deſtroys the weeds before ſeeding-time, whereas in the vetch ground the weeds had ſeeded before it was ploughed. That winter vetches prepare the earth for a barley-crop next year, is very much to be imputed to the ſummer-fallow ſuch ground may be ſuppoſed to have received the year the vetches were ſown in it; and the dominion the vetches get over weeds the following ſummer, by killing them, lays open the bare earth to the ſun the ſecond ſummer alſo, which in a manner anſwers to two ſummer-fallows.

It ſeems to me no ſmall regard ought to be had to keep cold clay-ground from running out of tilt, in reſpect that when it is ſo, the natural graſs ſo matts it, and it is ſo clung with the roots thereof, that the ſun cannot eaſily penetrate, to cheriſh and ferment the juices into vegetable ſalts; whereas, if you keep your ground knot-fine by ſummer-fallows, and clover-graſs, which gets dominion over the natural graſs, and plough it up before it runs to a ſword, the ground will be looſe and open, and eaſily penetrable by the ſun, rain, and air, whereby it will be capable of being impregnated much more with thoſe ſalts.

Not to ſummer-fallow when wet.

§. 4. On ſound experience I am thoroughly confirmed, that no land, eſpecially claiy, ought to be ſummer-fallowed, when it is the leaſt heavy by wet, in order to prepare it for ſpring-corn the ſpring following; for, tho' the ground may work mellow enough, as to the temper of the earth, having the ſummer's ſun to ſhine on it, yet, being ploughed wet or heavy, the graſs will grow ſo as to clod it together, and ſo matt the earth, that it will plough too rough in the ſpring to ſow ſpring-corn at once ploughing.—It is the ſame, in caſe ſtrong land or ſworded land be winter-fallowed wet, or ſtiff, and heavy, in order to prepare it for ſtirring the next ſummer for a wheaten crop; it will turn up monſtrous ſtiff and rough: in both caſes you give away your firſt labour.

Of FALLOWING.

I ſummer-fallowed a field when one part was burning-dry, the other part very dry alſo, but yet moiſter than the former; at Michaelmas that part which had been ploughed burning-dry had ten times more weeds come up in it than the other; from whence I infer, that the dryer you fallow ſtill the better to deſtroy the weeds.—Again, I fallowed part of a field burning-dry in July, immediately on which came a very hard rain, which made the furrows, though ploughed dry, fall flat and hard, in which at Michaelmas very few weeds, comparatively of what might have been expected, if ſuch rain had not fallen, were come up; for the ground was thereby faſtened before the ſeeds could chitt.

On ſummer-fallowing early in cold ſtrong land.

§. 5. The huſbandry of cold, wet, ſtrong clay-land in Wiltſhire is to turn it up as early as one can in the ſpring for a wheaten fallow; if the ground be ſo dry and ſtarky, that eight oxen and an horſe muſt be put to the plough, ſo much the better; on this fallow (that is, on this one earth) they ſow their wheat and drag it in, and have much better corn than if they gave their wheaten land three earths.—I think this huſbandry founded on very good reaſon; for ſuch land, being ploughed up in ſo hot weather and ſo dry, becomes mellow and perfect duſty; the earth being hard underneath, it will caſt off the rains into the hollowneſſes between the furrows, and will lie dry all the winter; whereas, if ſuch wet clay-land had been hollowed with two or three earths, it had lain ſogging in the wet, and drunk it up like a ſpunge, and the chill would have killed the corn; nor would it have fallen mellower under the harrow than the grete as above would do under the drag; and the common ſaying of the farmers in Hants, that they ſee not but white land brings as good corn as clay-land, ſeems to make good, that they often manage clay-land in Hampſhire ill in their ploughing.

Caution againſt letting the graſs grow too long on land to be ſummer-fallowed.

§. 6. I am very ſenſible on experience, that you ought not to let ground you intend to ſummer-fallow for wheat run too far to a head of graſs, ſo that the ſheep ſhall refuſe to keep it ſhort or bare; for if the graſs comes to that pitch, you will not be able to make the ſheep eat it, but a great deal of it will run to bents; and when you ſummer-fallow, the furrows will not cover and turn over the ends of the graſs, but it will lie out at the ſeams, and ſo being not covered from the air will keep growing, and the roots will conſequently live, and matt, and plough up very rough when it is thwarted, tho' the ground was ſummer-fallowed never ſo dry.

Manner of fallowing in Leiceſterſhire.

§. 7. In their common fields in Leiceſterſhire they give five tilts for their barley, and four for their wheat, five for their oats, and one for their peas and beans; their firſt fallowing for barley is about March, as ſoon as ſeed-time will give them leave; the ſecond the latter end of May, or in June, as hay-making-time will give them leave; the third in July or Auguſt, as harveſting will permit; the fourth the latter end of October, or ſooner, as the wheat ſeaſon will allow; the laſt earth is when they ſow, at the latter end of February or beginning of March: they ſay, if they did not make theſe many tilts the weeds would come up ſo faſt, and ſeed, that they would be quite deſtroyed with weeds. The tilts for wheat commence, as for barley, about March, and ſo they hold on according to their leiſure till they ſow, which is about Michaelmas, and within three weeks after.—From hence it may be obſerved, that the deep land of the north can never want rain at ſeed-time, or ſoon after, for their fourth earth being taken about September, or October, the winter paſſing over it, and the earth being four months ſtale when they come to ſow it, it muſt needs turn up ſo moiſt, as both to bring up the corn, and to ſupport it againſt the drought of any ſummer.

My ſervant was obſerving to me, that in Leiceſterſhire they cared not how deep they went with their furrow, when they ſummer-fallowed, which, conſidering how ſubject they were to weeds, he looked on as a great fault; for, ſaid he, if they went ſhallow, the ſun would have power to ſcorch up the weeds and their ſeeds in a ſhallow furrow, as ſoon as it moldered after the firſt rain; whereas when they turn up ſo deep a furrow, the ſeeds and the roots of weeds are buried and kept moiſt, and cool, and lie quiet, and not being influenced from the ſun and air to germinate and chitt, and thereby to be malted, they are ſecured in a ſafe repoſitory, in order for vegetation, when the earth is again ploughed up for wheat.

Of the DURABLENESS of ſome SEEDS.

§. 8. It is manifeſt a great many ſeeds will endure many years buried in the ground, and yet never rot nor periſh, but riſe up again in their plants, when the ground by tillage is made a fit matrix for them: but, foraſmuch as I can obſerve, theſe ſeeds are the ſmalleſt of ſeeds, ſuch as poppy, charlock, and muſtard-ſeed; for peas, beans, and other corn-grain, and acorns, and the like, will periſh ſoon, being buried in the ground; the reaſon of which ſeems to be, becauſe theſe ſmall ſeeds conſiſt of more oily or bitter juices, which preſerve them from moiſture, and, in the next place, they conſiſt of ſuch ſmall fibres or veſſels, that it is impoſſible, when they lie half a foot, or a foot deep in the earth, for the power of the ſun ſo to rarify the juices into ſuch fine particles, as to penetrate thoſe minute tubes, on which all vegetation depends: whereas, when by tillage they have a light bed of earth, thoſe ſeeds, which are turned up on the ſurface, lie in the warmth of the ſun, where the particles of the earth are made very active and fine to paſs their tubes. Thus thoſe larger ſeeds above mentioned, whoſe juices are leſs oily, and their tubes more open, are eaſily penetrated by the heavy and groſs juices, which lie a foot deep in the earth, but not being able to protrude a root downward, nor a plant upward, by reaſon of the cloſeneſs and preſſure of the earth, from a plethory of the juices it is neceſſary that an extravaſation muſt

follow, from whence a corruption muſt proceed. From hence I conceive it is, as Meagre writes, that primroſe ſeed, which is exceeding ſmall, being ſown in fine mold, ſome of the ſeeds will not come up under three, ſome under four, five, ſix, and ſeven years; ſome of thoſe ſeeds, I ſuppoſe, lay buried deeper, ſome ſhallower in the ground, and the juices that lie deeper require more time to be rarified than thoſe lying ſhallower.—That ſeeds are more hardy, and can endure more than is generally conceived, Mr. Rudge of Portſmouth gave me an inſtance; he affirmed, that until king William's time they did not uſe wormwood in their ſhip-drink; but that of late they have uſed it with their hops, which are conſtantly boiled two hours, and then flung out on a dunghill, and that in thoſe places now grow great quantities of wormwood at Portſmouth, where none grew before. And Dr. Bradyl of Leiceſter did aſſure me, that at a dyer's in that town, who uſed the attriplex baccifera, and boiled it in his dyes, after it had much boiling, and was flung out on the dunghill, there would grow up, in great quantities, from the ſeeds of it the attriplex baccifera: the berry of this plant is like a mulberry, and it's ſeeds are exceeding ſmall. When Mr. Ray ſays the eryſimus Neapolitanus (wild creſs, or hedge muſtard) did grow in that abundance after the fire of London, he adds, that this plant brings very ſmall ſeeds and in great quantity; therefore a hundred years might it lie without germinating, and not like to germinate then, unleſs it's tubes were put in action by the heat of fire. Sir John Floyer, in his Touch-ſtone of medicines, tells us, that poppies are very mucilaginous, and contain an oil, as appears by a milky juice; and an oil is preſſed out of poppy-ſeed: this ſeems to account for the great length of time they are ſuſpected to have laid in the ground, where graſs-lands after many years have been ploughed up, and this plant has come up ſo plentifully. Sir Thomas Brown alſo, in his Vulgar errors, gives ſeveral
Of equivocal generation. inſtances of the laſting vitality that ſome ſeeds are endued with. If Le Grand had been acquainted with, and conſidered theſe inſtances, he would not, I think, have ſo readily aſſerted the equivocal generation of plants; for his argument is,—If you dig up the earth an ell deep, it will, without ſowing, be fruitful the firſt year, but, if you turn it up deeper it will not be fruitful till after a year or two. [f] The ſeeds therefore of plants, ſays he, are thoſe inſenſible particles, which, by the agitation of the ſubtle matter, acquire that ſituation, figure, and motion, which are neceſſary towards the formation of the firſt rudiments of plants; but this formation is not ſo ſoon compleated, nor are plants produced ſo quickly this way, as in the ordinary manner of raiſing them from the ſeeds of plants.

Surely we have great reaſon to conclude, from the inſtances above mentioned, that the earth does not produce the moſt contemptible weed without a ſeed;

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[f] Plantarum igitur ſemina ſunt inſenſibiles illæ particulæ, quæ, per materiæ ſubtilis agitationem, eum ſitum, figuram, et motum acquirunt, quæ neceſſaria ſunt ad primum ſtirpis rudimentum efformandum; ſed eorum conformatio tardius abſolvatur, ſeriuſque ex illis plantæ proveniunt quam ex ſeminibus plantarum. Le Grand, p. 466.

a ſeed; and we find that even at the beginning God took not that method, nor did the earth bring forth plants in that manner when it was vaſtly rich; for it is ſaid, Gen. ch. ii. ver. 5.--" that God made every plant of the field before it was in the earth, and every herb of the field before it grew;" and it ſeems as if Moſes had ſaid this to prevent an hypotheſis, that matter could act ſo nobly on matter; what is recorded therefore in the preceding chapter, viz. that God ſaid, " Let the earth bring forth graſs, the herb yielding ſeed, &c." can only mean, that God bad it come forth out of the ground. Patrick will have thoſe words above quoted, " before it was in the earth,"—interpreted—before the ſeed was in the earth, which if the Hebrew will allow of, yet the foregoing words in that verſe, " God made every plant of the field,"—ſhew the earth did not produce plants, as cauſes naturally do their effects.

Of ſummer-fallowing for barley.

§. 9. A great advantage in ſummer-fallowing for barley is, that your barley-land ſeldom is ſufficient to provide for all the graſſes you ſow, and oat-land will ſeldom knot fine enough to ſow; but if oats be ſowed on the barley-ſtubble which was ſummer-fallowed, in all likelyhood it will knot very fine, and be fit to be laid down to graſs.

To ſummer-fallow for barley, in order to deſtroy weeds, you ought to fallow before the living weeds run to ſeed, and yet ſo late, that the ſeeds of ſuch weeds as are in the ground may not have ſummer enough to grow up and ſeed before winter come, but as ſoon as may be (avoiding the latter inconveniency) is beſt; becauſe when weeds are moſt turgid with juices, by being ploughed up, their roots are like to be killed by a plethory: for the time of weeds ſeeding conſult the herbal.

Lands lying to the north, being cold clay-lands, ſhould, if ſowed to barley, be ſummer-fallowed, in order to ſweeten the ground, and ſowed under furrow, the middle of March, if the earth can poſſibly be got dry enough, that the barley of land expoſed to the cold may be got ripe before the ſun leaves it, and froſty nights come.

Of fallowing poor cold land early.

§. 10. It ought to be obſerved by the huſbandman, not only what grounds are cold and foureſt, but alſo what part of every ground is ſo; this he will eaſily diſcern by the graſs the cattle ſhall refuſe, unleſs hunger forces them to eat it: in the hill-country we may generally perceive thoſe grounds, or parts of grounds, which lie upon a declivity from the ſun, or are cooped up between hills, ſo that the ſun cannot freely irradiate them all day, and are not ſo pervious to the air and winds, do bear a much ſourer graſs than the ſummits of the ſame field; and it is refuſed by cattle, eſpecially at a time when graſs is plenty: I do adviſe in ſuch caſe, that the huſbandman take hold of all opportunities and ſeaſons to turn up ſuch parts of a field early in the ſummer to the ſun, and alſo that he ſtir it more in the ſummer, thereby to ſweeten it for graſs, and render it kinder for corn; for he may be aſſured, ſuch ground as bears ſour graſs, however it may bear a burden of ſtraw, will not bear a plump berry, but a thin coarſe ſort, which will not fill the buſhel, as finer rin'd or floured corn will do.

On my farm there is land, which tho' very cold, poor, and whitiſh ground, or woodſeary, yet is very apt to run to ſour, rowety graſs, tho' it has born corn but the year before; on ſuch pieces of land we ought to have a circumſpect eye, both in reſpect of ploughing them very dry, and hot, and earlier than other lands, before they are run to graſs, ſo as to nip the graſs, as it were, in the bud.

Of winter-fallowing.

§. 11. I find the evil of white poor ground chiefly is, that all the ſpring time it ploughs up too dry to bring up the corn, and tho' it be juſt wet enough for mixed or clay-ground to bring up corn, yet that white ground ſo ſoon dries, either by heat or the cold churliſh winds, which come at this time of the year, that the corn is checked in its * chiſſum; therefore, if you ſow ſuch land on fallows upon a ſecond ploughing, my advice is, that you fallow early; for ſtale fallows will work moiſt. When you plough for ſowing alſo in the hill-country, there are advantages in ploughing the poorer or mixed land firſt, if it lies warm and in ſhelter, and the ſtronger clay-land laſt; becauſe, when the ſeaſon of the year for ſowing draws towards an end, the fallows being too dry for the corn to grow without rain, the ſull, in ſtrong clay-lands, that have a depth, may, without damage, be carried lower than the ſtale fallow, into the freſh mold, which will turn up moiſt, (whereby you may have your corn all grow) which, in hot ſummers, in the hill-country, is the life of a crop.

* putting forth its roots.

Of winter-fallowing dry.

§. 12. If ground be ploughed dry, tho' ever ſo much rain ſhould fall after it, it will ſoon be dry again, for the ſame paſſages the water found to wet it, are alſo permeable to the ſun: but if ploughed wet, it will not dry kindly again that ſeaſon, for the † grete is in a manner cruſt thereby, and blended ſo in a dab together, that the ſun cannot penetrate it; but his rays are refracted.

† mold.

I was obſerving to a certain farmer, that a certain field did not produce me ſo good a crop of oats as I expected, the ground having been fed to hop-clover for two years. The farmer replied, he believed the reaſon was becauſe the winter proved ſo wet, and, that being a white ground, we ſtill went thither in wet weather, becauſe ploughing in ſuch weather did not that harm in white ground that it did in other, but that white ground ſo ploughed bore the worſe corn, which I believe to be true. Beware however of either ſummer or winter-fallowing poor land in the hill-country too dry, ſo that it turns up deep, and breaks lower than the ſtaple: by experiece I know, you impoveriſh ſuch land as much, by jumbling the bad with the good, as a year's dunging with the pot can do it good; and all the experienced farmers I have conſulted, which are many, are agreed, that, tho' it is beſt to plough up wheaten land in dry weather, (for if it is fallowed wet, it will be apt to chill all the year) yet white land ſhould be ploughed up ſomewhat wet; for, when dry, it is apt to break up in too ſtiff clods, and turn up below the goodneſs of the mold. I have found by conſtant experience in our hill-country land, where the chalk in many places lies ſhallow, if, by reaſon of ploughing too dry, the chalk bruſh tears up, the corn will in that vein become defective ſome years after, tho' more manure be beſtowed on it than on other parts of the ſame land, where the chalk has not torn up: therefore fallow not ſuch land too dry.

The air and watery parts in earth ought to have a free circulation, as in our human bodies, otherwiſe a corruption and poiſon of humours ariſes: the caſe is the ſame in earth ploughed up wet, which clings and holds in all the watery body, which then is very much, till it corrupts, and lets in no freſh air, dews, &c. Now earth ſhould be always taking in and perſpiring out, even as our bodies do.

If ground be worked wet in ſeed-time, the wetter it is, the leſs can a plough diſpatch in a day; for if it clings and ſticks to the plough, and to the holder's ſhoes, it hinders the ſpeed, nor ſhall the harrows harrow it ſo well at eight tinnings as otherwiſe at four.

Of fallowing dry in cold land.

§. 13. If your ground be cold clay-ground, or ſour ground, ſuch as I have, take care to purſue the ploughing it up whilſt the ground is in the moſt burning condition, and dry over head; and ſtop when either of thoſe caſes are wanting; and either give your oxen play, or contrive ſome other work for them. When your ground is ſo ploughed up in fallowing, it will always turn up again rotten, and in good order; and by ſuch methods of never fallowing your grounds cold and wet, they will in ſome years time be marvelloully ſweetened, made healthy and kind for corn, and you will get a dominion over all common graſſes and herbs of the field, ſo that ſuch hill-country-ground, after it has lain down to clover, will turn up the ſecond year knot fine, or fryable, which is a very auſpicious temper to promiſe a good crop.

Different practice in hill- and vale-country, in winter-fallowing.

§. 14. The difference in practices amongſt huſbandmen is very great; to plough up many grounds in the winter, and let them lie ſo till ſeed-time, and then to ſow them with oats or barley on one earth, i. e. drag the corn in without more ploughing, is a frequent cuſtom amongſt the hill-country-men, which the vale-men, when they are told it, are ſurprized at, and ſay, if they did ſo, they ſhould have nothing but weeds, which I believe to be true; but, on the other hand, it is undeniable, that the hill-country-men, whoſe land lies cold, do this with good ſucceſs. Theſe different events ſeem to me to depend on good reaſons, viz. high hill-country-land lying bleak and cold, and being ſomewhat poor, yet, if it be of a claiy kind, being ploughed up early, will not, by reaſon of it's barrenneſs, and cold expoſition, produce weeds during the winter; the ſeeds of weeds in ſuch cold beds lie aſleep, till rouſed out of their lethargy by the warmer air and ſun of the ſpring; whereas in warmer ſoils, which lie in the vale, where the land is commonly richer, the ſeeds of weeds, even during the winter, if the ground be hollowed up by ploughing, and mellowed by rains and froſts, will ſprout and put forth a blade.

§. 15. I

Of ploughing unſeaſonably.

§. 15. I was ſaying to farmer Elton, it was the common opinion of farmers, that a team ſhould be ſtill going, in ſeaſon, or out of ſeaſon; but I differ'd from them; for when a ſeaſon preſented itſelf, and I was behind-hand, I ſhould not ſcruple the hiring three or four days work of a plough, and, if a ſeaſon did not preſent itſelf, ſhould not ſcruple the going on ſomewhat towards a ſecond year's crop. He agreed with me, and ſaid, 'twas better to be in the ſtable than to do things out of ſeaſon, and ſaid, there was a piece of one of his fields an inſtance of it; they went to fallow there in a wet time, becauſe they would not ſtand ſtill, and that part of the ground has worſted three crops ſince ſucceſſively, and made it run to weeds.

Winter fallowing.--Not to winter fallow acroſs the furrows.

§. 16. It ſeems to me to be very wrong (tho' in the hill-country, where the earth is conſequently dryer) to winter-fallow acroſs the lands or furrows, if poſſibly it can be avoided, eſpecially if the lands lie on a deſcent, and are of a cold claiy nature; for the current of the water is thereby ſtopt, and the field lying the wetter for it is thereby ſoured and chill'd; it ſeems therefore, that ſuch lands ſhould be winter-fallowed the ſame way the lands and furrows lie, if they lie upwards and downwards eſpecially.

The ground generally winter-fallowed better in anno 1718 than had been obſerved for many years: the reaſon doubtleſs was the long, hot, and dry ſummer the preceding year, whereby not only the earth, through the drought, was made more fryable, but alſo the free growth of all weeds, and their roots, which matt the ground together, and harle in the clots, was checked.

The philoſophers ſeem to agree, that in winter the air is fuller of nitre than in ſummer; therefore a winter-fallow, to let in the nitrous particles of the air, muſt be beneficial.

When winter-fallowing moſt ſeaſonable.

§. 17. It ſeems the winter-fallows of every ground are then moſt ſeaſonable, when you can make the furrows ſtand moſt upright, and ſo continue, with as little falling down as may be, that thereby the land may lie the healthier and dryer, and ſhoot off the rains; whereas by falling flat it lies ſoggy, ſpungy, and cold.—Accordingly I was telling a very good farmer in my neighbourhood, that I thought it was better not to winter-fallow ſtiff land till the froſts were near at hand; for, if one fallowed ſuch lands early in October, they might ſettle too much before the froſts might come to hollow them. He replied, if it was lay ground, it might be as I ſaid, but, if it was ſtiff land that was ploughed the year before, it was beſt, he thought, to plough it up as ſoon as I could, tho' the very beginning of October, before it had time to ſettle after it's laſt burden of corn; for then it would, when firſt fallowed, molder fine enough.—Tho' clay-lands however ought to be fallowed early for the better mellowing them, yet it ſeems to me no loſs of time, but rather gain, to wait a little for the dry froſts; becauſe in ſuch weather you will better effect your ends. If the fallows ſhould have been flatted by the rains, the froſt having leſs power over them, they muſt needs be more inclinable to run to weeds;

on the other hand, tho' fallowing ſhould happen when the ground is very wet, yet, if dry froſts follow, and not wet weather, ſuch fallows may do very well. The reaſon is, becauſe ſuch froſts uphold the ground from falling, till it ſettles in the ridges in an upright ſtanding, and conſequently receives the benefits of the froſts: but this venture is not to be truſted to, leſt wet weather ſhould come after ſuch fallowing, which is moſt likely, as the ground is already full of wet; and yet the farmers will plough and fallow in the wet, knowing, that they ſometimes have had as good corn after a wet fallow as a dry one; but of the accidents, whereon it depended, they were ignorant; otherwiſe I judge they would not have done ſo.—On the like reaſon, in my opinion, depends the wholſomneſs of the ſummer-fallows; for, if the fallow be wet, it will be in danger of falling flat, unleſs very dry weather follow, to ſupport the ridges: conſequently the ſun has leſs power over the parts, nor can it kill the weeds by it's burning heat, as in a dry fallow.

I gave a barley-fallow to a broad clover-field in July: ſome ſaid, it would not gain it's end, but lay the ground chill for the whole winter.—By Michaelmas I found it full of all ſorts of weeds green on the ground, which when ſtirred would all be deſtroyed.—Note, that fallowing land well carries a whole furrow in the winter, and cannot be ſuppoſed to lay a ground wet during the winter, but rather dry, ſeeing the furrows have gutters between them, for carrying off the water; but if the ground falls ſmall, then it may lie ſoggy and ſpungy. The harrowing this ground after it was fallowed, made it fine, ſo that it brought up weeds in abundance, which would be ſtirred in, and ſo deſtroyed, and yet it lay hollow underneath.

The reaſons of early fallowings and ſtirrings, or thwartings, ſeem to depend altogether on the nature of the lands you have to deal with; for if it be probable that ground may work dry and mellow at ſpring-ſeed-time, care ought to be taken to fallow ſo early, that you may thwart early, I mean in January, that your ploughing at ſeed-time may be moiſt; but your fallowing, if the ground be not graſſy, may be later, eſpecially your thwarting, viz. not till March, if you are apprehenſive your ground is like to be too wet at ſeed-time; for 'twill plough much the drier at ſeed-time for being thwarted late in a dry ſeaſon.

I fallowed a lay-ground to graſs in October and November; I began very early to plough it, and ſow barley in it, viz. the 25th of March: notwithſtanding the fallows were very ſtale, and, being ſowed ſo early in the year, one would think the ground moiſt enough to bring up the corn, as by turning up the furrows it ſeemed to be, yet the ground ploughing very rough, being of a white nature, and requiring ten tinings, it was a very great diſadvantage to the corn's coming up, there being no rain; for the weather was hot, or windy and dry, when it was ploughed, and the tumbling it up and down ſo often with the harrows dried the ground too much: ſo therefore to order white ground, that it may harrow at four or five tinings, and thereby not loſe it's moiſture, is good huſbandry.

Mr. Raymond ſays, the good huſbands with them (in Wiltſhire) fallow up all the lands in the beginning of winter, and finiſh by October, if they can, whilſt their horſes are at graſs, and then lay them up at a cheap keeping all the winter: this they do in Leiceſterſhire, as I have elſewhere noted.

Seeing the finer the earth is tilted, the more each part of it communicates it's virtue to the grain laid in it; I ſuppoſe the finer it is winter-fallowed (for the ſame reaſon) the more the winter rains and froſts communicate their virtue to the land.

Of winter-fallowing for wheat.

§. 18. The finer the earth is made by often ploughing for wheat, the cloſer it lies all the winter to the roots of the corn, provided you ſow your corn in good time, ſo that the froſts come not to hollow it before it is ſettled; for, not having time to ſettle, it is in more danger of being hollowed by the froſts. From my walking over the fallows, and obſerving how dry, and healthy, and expoſed to the froſts, weather, and ſun, the convex parts lay, and how the many ſmall concave parts and hollows lay to receive the ſun's ſtrongeſt heats, I cannot but think it great huſbandry to fallow up graſſy, or ſtrong clay-lands in the winter-ſeaſon, for wheat, tho' one muſt give them an earth the more poſſibly in ſummer, by fallowing twice inſtead of once: indeed this cannot be done vice verſâ to barley, by giving that a ſummer-fallow, becauſe barley is ſown after ſome corn that grew the ſummer before.

By winter-fallowing for wheat you have this certain advantage, that the fallows are ſo mellowed by the winter-froſts, that all the ſpring and ſummer long they drink up the rains and ſummer-ſuns the more greedily.

In winter-fallowing for wheat there alſo ſometimes falls out this advantage (as in annô 1705, when no rains fell from April to the ſecond of July) that you have not only ſo much land fallowed before-hand, when no plough could fallow in lay-lands by reaſon of the dryneſs, and conſequently the farmers muſt be behindhand; but you may alſo all that ſeaſon ſtir the winter-fallows, for all that time they will work.

Of winter-fallowing for barley.

§. 19. Whereas in the ſtrong deep lands of Buckinghamſhire, and in ſome other counties, where there are ſtrong lands, the farmers hold it ill huſbandry to ſow much barley, and they are reſtrained from it by their landlords, from an opinion that barley impoveriſhes their land beyond other corn.—I am apt to think, if barley impoveriſhes ſuch clay-land, it muſt proceed from the winter-fallowing it, and tumbling it about in cold raw weather, when it is wet, being cold clay-land, whereby it is chilled and ſoured; whereas I ſuppoſe they plough not up for peas and beans and oats till the ſpring of the year, when they are ſown; and peas and beans hollow and mellow the ground.

The firſt conſiderations, after wheat and vetches are ſown, in order to a barley-crop, are of this nature, viz. to fallow up thoſe grounds which you do not fold, and of them to fallow thoſe firſt which are declivous from the ſun, or by reaſon of high trees or hedge-rows are much ſhaded, or by reaſon of hedge-rows or declivities are ſkreened from the north and eaſt; for all ſuch grounds may and ought to be ſown firſt with barley; and therefore the earth ought to be prepared firſt, and if ſuch fields are to be folded, they ought to be folded firſt, in order to be fallowed as ſoon as may be.

Of winter-fallowing for oats,

§. 20. Mr. Edwards obſerves, the firſt thing the farmers do after harveſt is to fallow for black oats; for the older the fallow is they ſow black oats on they obſerve it to be the better; but, if they ſow white oats, they fallow but before they ſow, for the later the fallow is for white oats, they count it the better, for white oats love to lie light; and, ſaid he, they never give two earths to black oats, but, if the ground be ſuch as is run to graſs and a ſtiff ground, it is better, and will well anſwer, in caſe you ſow white oats, if you give it two earths; nay, ſaid he, ſome of our clay-lands are ſo ſtiff, that it would very well pay if two earths were given to peas alſo, for it is impoſſible ſometimes they ſhould ſhoot their heads through. I ſaid I never knew two earths given to peas before; he replied, farmer Biggs, if I would talk to him, would tell me the ſame thing; and he was ſure he loſt half a crop for want of it.

and for peas.

It was the 16th of October, and farmer Biggs had fallowed for oats; I aſked, whether the land (he ſowing on one earth) would not be too ſtale, and lie too hard at ſeed-time. He ſaid, no; if land worked light (for on this land he had ſowed oats alſo the laſt year) it would be in fit temper enough at ſpring; that he and others commonly gave a fallow to ſome oat-land by the very beginning of October.

Of Winter-fallowing early for OATS and BARLEY.

§. 21. On the 20th of October, 1719, I began ploughing a field of fifty-two acres for oats, which had been ſown to corn, and chiefly to vetches, ſo that the ſtubble ploughed up ſo fine and ſmall, that it might be well ſuppoſed the ground by the winter rains would fall flat: I had finiſhed ploughing theſe fifty-two acres by the 20th of November.—Notwithſtanding it was light and white ground, and fell ſo fine, yet at the oat-ſeed time, Feb. 20, the harrow tinings being good, the oats were laid deep enough in the furrows or ſeams; for tho' they ſeemed to be cloſed, they were not ſo, but there were cavities underneath, tho' the ſeams cloſed at top. This ground was all harrowed off at five tinings, which was the effect of early ploughing in the winter. This method of fallowing light ground ſucceeded admirably well, and anſwered in every reſpect; the oats were let in deep enough, and proſpered in colour beyond thoſe I ſowed that year in ſtrong land on two earths, and when I mowed them, the 15th of Auguſt, they were in every reſpect great oats, and the hop-clover I ſowed with them ſucceeded very well. I concluded therefore from this and other experiments, that ploughing ſuch light ground (which falls fine) thus early is beſt, ſince the oats can be let deep enough into the ſeams, and by that means the ground ſo ploughed, taking the winter rains, will retain ſo much moiſture as to bring the oats all up, the contrary of which is the danger in all ſuch light grounds.—For the ſame reaſon I began fallowing ſuch light lands for barley as early as the middle of October this year, that ſo they, being beaten flat by the winter rains, and being drunk with them, might retain ſufficient moiſture to bring up the barley at ſpring.

In the beginning of November, 1712, I ploughed up four acres of a field conſiſting of fourteen acres, which had lain down to broad clover for two years, during which it was mowed: tho' it was a clayey ground, it broke pretty * knot by the plough, and therefore, having much other buſineſs in hand, I thought I might delay the tearing up the reſt till the latter end of January, and that it would harrow very well by the latter end of February, ſowed to oats; accordingly, the latter end of January I ploughed the reſt, and ſowed the whole field with black oats the latter end of February: the ground dreſſed with the harrows very well; only this difference I obſerved; the four acres ploughed in November was broke by the froſts to duſt; the other part ploughed laſt was not ſo fine, but worked very mellow. This experiment I made on conjecture that the four acres ploughed ſo early would carry the beſt oats, and my expectation was anſwered; for the whole field from the firſt appearance gave me great hopes of a good crop; but by the latter end of May the four acres ploughed ſo early was diſtinguiſhable in colour, to lookers on, at a quarter of a mile diſtance; for it was much the ſtronger, and darker in complection. June the 8th, which was three days after, I took a view of another field, conſiſting of ſix acres, which I had ploughed in the winter in the former manner, viz.—I ploughed up four acres thereof in October, when the ground was very dry, and in January I ploughed up the two remaining acres, the ground being likewiſe then very dry. This field had been, as the other above mentioned, ſowed two years to broad clover, and it turned up mellow in both parts, when ſowed to black oats in the latter end of February, and harrowed knot-fine, only with this difference, that the four acres ploughed up in October worked in duſt, or like aſhes. The conſequenec of this huſbandry was as the former, viz.—June the 8th the oats in the four acres, ſo early ploughed, looked more proud, were thicker, and of a deeper green than the two acres; and it is to be noted, that, in both the grounds, in thoſe parts which were ſo early ploughed, no graſs appeared during winter, nor at ſpring, to prejudice harrowing.

* fine.

Of fallowing for peas.

§. 22. I talked with ſeveral very experienced farmers concerning fallowing for peas: they all agreed, that their crop of peas would be better if they did, and it would pay the charges, for ſometimes their crops were bad for want of it; but it ſeems they had ſo much other work for their ploughs that they could not allow time for it.

To ſummer-fallow for peas doubtleſs would be as proper as for barley; in which caſe you need not ſtir the ground again, but harrow down the roughneſs of the furrows before you plough for ſowing; your ground by ſuch ſummer-fallowing, or indeed by an early winter-fallowing, being laid curiouſly dry, will bear with the ſowing the peas earlier than otherwiſe, which has many advantages.—For this reaſon it is, that the vale-farmers ſow not their peas ſo early as we in the hill-country do, tho' they lie warmer, becauſe their land is wetter, and conſequently colder; but their barley they ſow a fortnight ſooner than we, for by that time the ſun has well heated their land.

Of ploughing for peas.

§. 23. This year, 1702, happened to be a very dry year, and ſummer: an old farmer came to me, and lamented his bad crop of peas, and ſaid, they were worth little, and that they were ſo from his hiring his ploughing, which was of too little ſtrength; for, ſaid he, we had not horſes able to go deep enough; if we had had ſtrength to go an inch or two deeper I had had treble the crop, for then I had laid them deep enough from the ſun.

From hence may alſo be concluded, that the later in the ſpring you ſow peas, the deeper you ought to go.

From what I have obſerved this year, 1715, it is evident to me, that, if I ſow peas in cold clay-ground, I ought to lay the lands round and ſmall, viz. after the rate of five, ſix, or at moſt ſeven furrows in a ridge, whether I ſow over or under furrow; for wherever the land lay flat, and pitched, or ſunk a little, there the peas failed, and did not come up, and thoſe that did, continued all the ſummer in an unthriving condition; and yet the ſpring after they were ſown was not wet, tho' indeed we had often cold dry winds; the ground theſe peas were ſown in ploughed up very mellow and dry, and was ſummer-fallowed. All theſe advantages give a plain proof to me of the profit of laying the lands in ſuch grounds round, and I doubt not but where the ground was moſt healthy, and the peas more flouriſhing, yet both would have been more ſo, if managed as above ſaid. The peas, from which I made this obſervation, were blue peas, ſowed ſo late as the 19th of March, when the cold weather might ſeem almoſt over.

On experience I am very ſenſible, that if peas be ploughed under furrow, in ground where one ploughs up-hill and down-hill, very great care ought to be taken that you do not bury the peas; for if the plough going down-hill be not took up, or held up with a good ſtrength, it will be very viſible at the time of their coming up; they will not come up half ſo thick in that half of the land, that was ploughed down-hill, as in that half that was ploughed up-hill in every land reſpectively; therefore, in ſuch land, and eſpecially when ſo careleſsly ploughed, it muſt be evident there requires good dragging, and very good harrowing, to break and tear the furrows into ſmaller pieces, and to open them well, and hollow their compact cohesion, ſo that the corn may come through. Indeed no corn ſhould be ſowed under furrow, where the furrow turns up whole, or does not break well into ſhort pieces, but the drags ought to tear ſuch ground firſt, before it is harrowed; for in ſuch caſes the harrows do but ſcratch the back of the furrows, and when that looſe earth is waſhed away, or ſettled, the back of the furrows will appear intire and hard. I was plainly convinced of this in ſowing peas under furrow in the two former years, but eſpecially in ſowing them ſo this year, 1716. From hence it is obvious, great care ought to be taken in well harrowing the ground, and that they, who go with the harrows, ought to be well over-looked. It alſo ſeems to me, if ground ploughs rough, ſo that it may require much harrowing, and yet is ſo heavy as to be in danger of treading, the beſt way is to drag it once or twice firſt before it is harrowed, becauſe one turn of the drags will tear ſuch ground more than three turns of the harrows; and it ſtands to reaſon the horſes need go over it ſo much the ſeldomer, and ſo the treading will be the leſs; and it is to be noted farther, that, if a dry ſeaſon falls out, and ſuch peas, ſo ſowed under furrows, are not harrowed well, they will have the more difficult taſk to get through.

Of winter-fallowing chalk ground that is run to a ſword.

§. 24. If a ground be run to a ſword, or run out of the ſown graſs, and fit to be ploughed up, in caſe the grete, or mold, is but ſhallow, and the chalk near the top, I think it is good huſbandry to give ſuch a ground, for wheat, a winter-fallow; for then you can take a leiſure-time for it; and be ſure to take a time when the ground ſhall be moiſt, wherein you may go as ſhallow as you pleaſe, and then may ſtir it to your own mind in ſummer; whereas, if you fallow ſuch a ground in ſummer, and the ſeaſon be dry, as it ought to be, it is odds but you turn up the chalk; for if the ground be dry, there is a looſe ſpungy coat between the firſt coat and the chalk, which, being hollow, will ſuck in the plough, ſo that you cannot help ploughing up the chalk; and this method I believe will compenſate very well for the loſs of the graſs.

Manner of the hill-country in winter-fallowing for barley condemned.

§. 25. A field of mine was very well dunged for wheat the ſummer 1713, and bore a good crop of wheat; in ſpring 1714, I ſowed it to barley, having had a good ſeaſon for winter-fallowing, as alſo a good dry ſeaſon at ſpring for ploughing and ſowing it, and a hot ſummer, and the barley came up well; yet I do not believe I had two quarters of barley on an acre.—This ground is a ſtrong clay-ground, and it lies aſlope north-eaſt.—I am thoroughly ſatisfied by experience, that the way of the hill-country-huſbandry of ploughing and ſowing ſuch ground four years together, that is, to four crops; the firſt of which is wheat, and the other three ſpring-corn, for which laſt three they winter-fallow only; I am, I ſay, ſatisfied this cannot be good huſbandry for ſuch ground; for the firſt ſummer-fallow it receives for wheat, whereby it is warmed, mellowed, and ſweetened, can by no means qualify the coldneſs, heavineſs, and ſourneſs it receives the three years afterwards by the three winter-fallowings for ſpring-corn; nor can, I conceive, any other than the aforeſaid reaſon be given, why ſuch land ſhould produce but two quarters of barley per acre, which in goodneſs and ſtrength was ſufficient to bear four quarters.—Therefore ſuch ground ſhould after the wheat-crop receive one or two ſummer-fallows every other year for ſpring-corn, before it will be in right temper to receive a winter-fallow for a barley-crop, in order to lay it down for graſs-ſeeds.

Summer-fallowing preferred to winter-fallowing.

§. 26. To plough-in a good ſword of graſs by a ſummer-fallowing ſeems to be of much greater conſequence to the improvement of the land than the doing it in winter; for the winter is too cold to ferment it, or to raiſe and fix thoſe bodies of ſalt thereby, which lie in thoſe graſſes; it being eaſy to be conceived that the moldineſs, and ſinnowyneſs of the graſs ſo ploughed-in in ſummer muſt be much greater than in the winter; for which reaſon cow-dung and horſe-dung, made in the fields by the cattle's ſoiling, falling ſo thin, is not of that conſequence ſome are apt to think, becauſe it never ferments, nor heats.

There is a great nitre and ſalt in roots, as appears by Grew, wherefore the ploughing-in broad clover-roots, which are ſo big and thick in the ground, before they are dead, by a Midſummer-fallow, to precipitate their rotting or fermenting, whereby their ſalts are fixed, is of great conſequence; whereas by the inſenſible decay of the root by canker it is ſo leiſurely done that it has not fermentation enough to raiſe a good body of ſalts.

When there is a graſſy turf on ground it is obſerved to bear much the beſt corn; the reaſon of which ſeems to be, becauſe the graſs and roots turned down under furrow do heat, and thereby raiſe a great quantity of vegetable ſalts; for this reaſon it was I had ſo great a crop of broad clover by ſummer-fallowing its aftermaſs, and do look upon it, if a ground has a graſſy turf on it, and not too rank or poor for barley, it is beſt to ſummer-fallow it for barley; then to give a winter-fallow for oats, and ſow them on the back; becauſe in the winter-fallow, tho' the graſs rots, yet it does not ſo heat, for want of ſun, as to raiſe from it's rotting ſuch a quantity of ſalts.

Of ploughing ground that has a ſword in winter.

§. 27. To plough a graſſy ground in winter, when the ſnow lies on the ground, or when it is a wet ſeaſon, is to bring up the weeds; for the ſword of the ground being turned in when wet, lies there ſogging, and grows chill, keeping wet all the winter, nor will it eaſily dry.

Farmer Biggs ploughed up a fallow for peas, being a lay-ground with a ſword; he ſaid, he would fallow it as ſhallow as poſſible, which was very judiciouſly conſidered; for undoubtedly, if a ground be run to ſword, and is to be ploughed againſt the winter, the ſhallower it is turned up the more power the froſts will have over the roots of the graſs, in rotting them; and there is no doubt, if the plough ſhould go deeper at ſowing-time, but that the freſher earth underneath will turn up mellow.

Of fallowing head-lands in ſtrong land.

§. 28. A lay-ground having been ſown to broad clover-graſs two years, about the 8th of November we began to fallow it; and the 18th, when they had fallowed all ſave the head-lands, my bailiff ſaid to me, that he believed 'twas beſt not to fallow the head-lands, for, being ſtrong land and graſſy, they would at ſowing-time turn back again whole, which appeared very reaſonable to me; ſo they were left unploughed.—From hence I do infer, that when grounds are large that are to be fallowed, and are ſtrong lay-ground, it is good to plough round the head-lands at firſt hand of the year, though the plough ſhould be carried out again for a month or two; there will be time thereby given for the head-lands to rot, that they may turn up mellow when they are ſtirred again. Nor will the trampling on them when the ground is fallowed dry, do any harm, but good; this will make the head-lands ſweet, and bear a good bodied corn.

Autumn-fallowing ſtrong graſſy ground.

§. 29. I was ſenſible by experience this year (anno 1714) that, if ſtrong clay-ground have two earths given it to wheat, and after the wheaten crop is taken off, it lies the next ſummer to graſs, and is ploughed up at autumn, tho' ſuch ground be run to a thick matted ſword, yet it will turn up rotten and mellow at plough-ſhear, ſo as to ſtir well in the thwarting at ſpring.

Of the METHOD of Ploughing for different ſorts of CORN.

Of ploughing wet cold land to one earth.

§. 30. They find by experience in the vale, that it is beſt to ſow wet clay-land on one earth, for thereby the corn lies dry, whereas if they gave it two or three earths, and wet came, it would lie poachy, and cold, and thereby the corn would be chilled.

If lands are to be ploughed up and ſowed to one earth, which have lain ſix or ſeven years to lain or graſs, ſuch ground will turn up with a much evener furrow, and a great deal more may be ploughed in a day, in caſe you plough up the ground the ſame way the furrow went laſt.

I was aſking the farmer who rented ſome lands of me, which I have lately taken into hand, how it came to paſs, that a certain parcel of ground, which I had ſowed to rye-graſs, run ſo much to erſhes, it ſeeming, when the corn was down, almoſt choaked up with rowety graſs. He replied, that thoſe grounds had not been ſown for three or four years laſt paſt but to oats, which having but one earth, and ſtiff land, the ſword of the graſs and the root had not been killed, whereas, had it been ſowed to barley, it would have been in as good tilt as any other land.

Why ploughing poor land brings weeds.

§. 31. It is plain why ploughing of poor land brings weeds; not only on account that the coulter in lay-ploughing cuts the roots of the weeds in many pieces, all which grow, but alſo foraſmuch as thoſe roots will emit ſtronger ſhoots than the corn can, which proceeds only from ſeed; and conſequently, the weeds muſt over-top, and be more luxuriant than the corn.

Of ploughing white land to one earth.

§. 32. Notwithſtanding it was very white ground, I ploughed three earths, and then ſowed French graſs and barley in it: I had the eveneſt and beſt crop, I believe, that ground ever carried.—I ſowed the ground when it was as wet as the plough could well go, which I believe is beſt for white mortar-earth-ground, which is not on a clay.—The reaſon why farmers ſow white land on one earth, I judge to be from their great inclination to ſave charges, white earth being more capable of bearing a crop in that manner, as being leſs ſubject to weeds than clay-land.—The reaſon again they offer in argument for ſo doing is, and from experience too, as they pretend, becauſe they have had worſe crops on two or three earths than on one.—The true reaſon of which is, becauſe they have never ſowed ſuch white land on two or three earths by choice and forecaſt, but by neceſſity, that is, when they have been negligent in taking their time for ploughing up ſuch land, and have defer'd ſo doing too long, whereby it has worked rough; then on force they have ploughed it again, or poſſibly the third time, to correct the firſt error, and all in vain, and ſo have had bad crops; whereas, had they deſigned three earths from the beginning, and ploughed the firſt early, and acted uniformly in their ſecond and third earths, I believe, they would not have repented it.

It is uſually obſerved, that the white land in our hill-country, if ploughed to two earths, and thereby made light, is very ſubject to poppy, which we call red-weed, but clay-lands are not ſubject to it; the reaſon of which ſeems to be this: the poppy-ſeed is an exceeding ſmall ſeed, (Mr. Ray computes many thouſands to lie in a pod) and for that reaſon is eaſily buried in clay-land, and leſs able to ſhoot it's ſeed-leaves through, becauſe the clay ſoon ſettles and binds; but through white land, made light by ploughing, it's ſeed-leaves eaſily paſs: it is very likely therefore (the evil of red-weed being ſo great) it may be better to ſow white land on one earth.

There are ſeveral ſorts of light or white chalky grounds in the hill-country, which (when ſowed to wheat) ought to be ſowed on one earth, otherwiſe they will be ſubject to red-weed or other weeds; ſo that there ſeems a neceſſity to give ſuch land but one earth, whenever it is ſown; for it will not bear being torn to pieces, tho' it had lain many years to ſword; ſo care ought to be taken, that ſuch land does not lie down too many years to graſs, leſt it ſhould turn ſo ſtiff and tough, that drags will not tear up enough of the coat or mold to cover the wheat, and ſo it ſuffer on the other hand by lying too ſhallow, and on too ſtiff a ground. If ſuch ground has lain ſo long to graſs, as to be ſtubborn, there is a great hazard but it produces the leſs crop, eſpecially if it be in a gentleman's hands, whoſe many avocations call him from home, and from a due attendance in the field whilſt ſuch land is ſowing, it being very likely where much dragging is required, and labour to dreſs the ground, that ſervants will be ſparing in it, than which nothing can in ſuch a caſe be more prejudicial; and in all caſes, it ſhould be moſt the care of a gentleman, eſpecially for the reaſon abovesaid, ſo to contrive the ordering his ground againſt the ſowing-ſeaſon, that, if poſſible, it ſhould be in ſo good temper, and order to receive the ſeed, that it ſhould not be in the power of the ploughman to hurt him, unleſs he went wilfully ſo to do.—Such ground ſhould be ſo nicked in ploughing up for wheat on one earth, as to turn it up when the furrow is a little inclinable to break, or be rotteniſh, eſpecially when we may hope it will do ſo, and grow a little mellow by lying a while to ſun and rain.

Of ploughing to one earth for barley.

§. 33. In a burn-beaked ground I ſowed barley and French graſs the 18th, 19th, and 20th of March under furrow; the reſidue of the month was very dry, and warm, but the month of April to the 20th, had every day dry, cold, and churliſh winds, and the 17th, 18th, and 19th, there were hoar-froſts in the morning.—On the 20th of this month I viewed my barley, and found moſt of it looked wan, and ſome of it yellowiſh by the cold winds and hoar-froſts; but there happened in this ground to be a linchet ploughed up in the winter, on which barley had been ſown on one earth; this barley, tho' the ground was new, did very manifeſtly complain, and was quite yellow, which proceeded from it's lying ſo ſhallow, and from it's diſability to ſtrike roots in the firmer ground of one earth's ſowing. Barley ſowed on one earth in other places I obſerved to be very yellow on the ſame occaſion; I do therefore infer, that barley ſowed under furrow will better bear cold than that ſowed on one earth. Part of this white land, over which the ſheep had often gone to fold, did not in the leaſt complain; but the leaves kept broadly extended in their full verdure; whereas the others gathered up together, or loſt ſomewhat of their colour. The French graſs ſowed in this ground all this while did not in the leaſt complain, or the ſeed-leaves abate of their verdure.

I find not only Captain Hedges, but Mr. Weſton and others make ſome objections to my over-fondneſs of ſowing my barley always, and my whole crop on one earth; ſaying, that in hot ſummers the ears will ſhrink and want nouriſhment, by reaſon the roots cannot ſtrike a depth; but farmer Bachelour of Litchfield will by no means, allow this to be an objection, for he ſays the contrary of this is true, and that in the drieſt and hotteſt ſummers his one-earth-corn flouriſhes and looks greener than his two-earth-corn. It muſt then neceſſarily be, that when Captain Hedges and Mr. Weſton, &c. made this their obſervation, they ploughed their white land either too wet, or too late, when they ſowed their one-earth-corn, whereby the froſts had not time to ſlat it, and ſhatter it to powder; and ſo the drags could not raiſe a grete to let the corn in deep enough.

Farmer Biggs aſſured me, that he had found by experience, that it was much the beſt way to ſow barley on one earth, if it was poor white land; on ſuch land he was weary of ſowing on two earths, being ſatisfied he had thereby loſt his crops.

In ſowing corn, as oats or barley, to one earth, in the hill-country, I conceive theſe to be the proper rules, and which I do practiſe, viz. to plough a narrow furrow (not a wide and broad one) that the winter froſts and rains may have the more power to mellow and ſhatter the furrows againſt ſpring, whereby the ground will harrow the better, and the harrow tinings go in the deeper. To this end, that the ground may harrow the better, I always take a time of ploughing ſuch ground not only early in the winter, but alſo in a dry ſeaſon; and I take care to fence ground ſo ploughed, during the winter, and till I ſow it, from ſheep, leſt they, by treading it, eſpecially in the wet, ſhould tread down the ridge of the furrows, and make it mortar.

On ploughing to one earth for wheat.

§. 34. I ſee not why they, who ſow wheat on one earth, ſhould ſow the earlier, as the cuſtom is, unleſs on account that the drags cannot raiſe a deep grete; and ſo the corn muſt get an early root, leſt it ſhould be too much expoſed to the winter: but provided your ground be in very good heart, and the earth mellow, that the drags may, when loaded, enter deep, I ſee not why ſuch one-earth-corn may not be ſowed at Michaelmas.

From the obſervation I have made theſe three weeks, on wheat now growing (May, anno 1712) I paſs my judgment, that wheat, if ſowed ſeaſonably, i. e. between the 6th and 20th of September, when ſowed on two earths, or on the ſecond ploughing, will carry a better colour about the beginning of May than the wheat ſown on one earth; for the latter, tho' it might ſeem much the more flouriſhing, and of as deep a colour during the winter, till towards May; yet the ground ſowed to one earth lying cloſer and harder than the other, the wheat could not move, nor ſtrike ſo good roots as that ſowed on two earths would do; when the ſpring began to grow dry and hot, it would give off it's ſupport to the corn; which will then be apt to turn to a bright and paler colour, and the weaker tillows and branches, which made a ſhow in the winter, will not come on, but ſtarve; whereas the wheat ſowed on two earths will, when hot weather comes, flouriſh with a deep green, and fulfil all it's branches by nouriſhing them, it having a depth of mold, and mellowneſs in it to maintain the roots. From hence it appears how neceſſary it is to plough deep, where the ſtaple of the ground will allow it, and to lay the ſeed into a good depth of mold well prepared and ſhattered by being broke with the plough.

However white light lands, as elſewhere obſerved, are better ſown on one earth; nor can a great crop be all ſown in ſtrong land, and on two earths, in cold hill-countries, becauſe it cannot be in that manner ſown time enough, and the neglect of that would be a worſe evil than ſowing on one earth.—I muſt alſo obſerve, that my land, which is more braſhy and full of ſmall ſtones, and of leſs depth of mold, though better ſupported with pot-dung than the parts, which were only folded, brought leſs wheat than the other; for which no other reaſon can be aſſigned, but that the plough could not turn up a furrow of that depth as in the other part, and conſequently the corn ſuffered by the weather in the ſummer-months, when it grew dry.—If it be objected to this obſervation, that barley ſown on one earth is generally ſaid to bear the hot ſummers better than that on two earths, it muſt be replied, that, when barley is ſpoken of in ſuch a manner, it muſt be intended of barley ſowed on white land, or ſuch light ground as would lie too hollow, if ſowed on two earths: of ſuch ground it is true alſo, that wheat ſowed on one earth will endure the ſummer better than that ſowed on two.

Of ploughing to one earth for barley after wheat in the hill-country.

§. 35. It is a common practice, in our hill-country, for farmers, the year after they have ſowed light white land to wheat on one earth, to turn it up again early the next year, i. e. in October or November, to ſow barley again on the back, or on one earth; and this they do, becauſe ſuch land is poor, and will not anſwer the expences of two or three earths; and it is a queſtion whether leſs than three earths would moſt times make ſuch ground knot fine; becauſe ſuch white land in our country, being ſowed the year before to wheat on one earth, is ſubject, eſpecially if the ſummer prove wet, to abundance more rowet and graſs than our cold clay-lands ſo ſowed would be; conſequently it would be difficult to deſtroy it, and to make the couch tear out at the third earth, tho' one ploughed it in early; therefore they endeavour to feed the rowet with a great ſtock of cattle as ſoon as the wheat is off; notwithſtanding which, you will, if you have a good quantity of it, have a hard taſk to get it eat cloſe time enough for your plough to enter.—I do not approve of this huſbandry of ſowing ſuch land the next year after wheat, as aboveſaid, on one earth to barley, for the reaſon following, viz. ſuch land is commonly of a ſhallow grete or ſtaple, and therefore muſt be ploughed up ſhallow, and the rowet, which is turned underneath ſuch a furrow, will not rot by ſpring, but the roots will mat and hold the earth together, notwithſtanding the froſts may have conſiderably contributed to the tearing it to pieces;—

ſo that, what with the ſhallow furrow you was obliged to plough, and the cloſeneſs of the earth, your drags and harrows will not at ſpring be able to get deep enough to give the barley a deep, and an eaſy bed, and conſequently the barley muſt ſtarve in ſummer.—I do therefore rather recommend ſuch land to be ſowed to oats, in the ſame manner as you would do to barley: oats being ſowed a month earlier, will have eſtabliſhed a root, and put forth tillows before they are pinched with hot weather, and will better endure to lie ſhallow than barley would do.

Of one earth to wheat.

§. 36. It ought to be conſidered, if we ſuffer poor ſhallow ground to run out of tilt, by letting it run too long to graſs, it will, if ploughed in ſummer, be apt to ſpalt up below it's ſtaple; and if, to avoid that, you plough it up in winter, when it is moiſt, and will plough ſhallow, in order to ſow it to wheat on two earths, poor ſhallow ground will bear more weeds and leſs corn being ſown on two earths than on one.—The beſt way therefore is always to plough up ſuch land before it be run to too ſtrong a ſword; that you may turn it up to a ſhallow furrow, and be ſecure of it's working and tearing mellow under the drags at ſeed-time, when you ſow it to wheat.

Farmer Biggs and his ſon, both aſſured me, that though white land did well with wheat on one earth, yet that they had always found it do better with two; but, ſaid they, on about an acre or more of white land, to which this year (1702) we gave two earths, the wheat lies with it's roots out of the ground, there being but a little fibre or two at moſt that holds the root, and can feed it, ſo that it can carry no ear; for it is impoſſible it ſhould have a full grained corn, where there is ſo little conveyance of nouriſhment to it.—I aſked farmer Biggs how that part of the white land ſowed on two earths came to be ſo much worſe than the reſt. He ſaid, becauſe the land was ſide-long, and had a falling both ways, ſo that when at ſowing-time they ploughed it up and down, one land having another falling againſt it, every other furrow, falling with the ſide-land and not againſt it, filled up without a ſeam, ſo that, the land working fine, the corn could not be buried.—The beſt way is, ſaid he, to ſow white land on two earths, and to ſow the laſt under furrow.

But I have ſince found by experience, that, tho' two or three earths may be beſt for wheat on ſtrong red clay-ground, (red-weed not being ſo apt to grow in that, tho' made never ſo fine) yet that either two or three earths is very improper for white light ground, or half red earth half white; for the finer ſuch ground is made it is ſo much the more ſubject to red-weed, or poppies, eſpecially if the ſummer prove cold and rainy, as in 1715.

The farmers of our hill-country ſay, they have found by experience, that it is beſt, when they ſow wheat on one earth, which is always done early, to ſow old wheat rather than new; becauſe the old wheat is not ſo forward, and apt to run away to a graſſy head, nor to be ſo proud as the new, which are faults at the forehand of the year.—This ſeems reaſonable to me.

Of giving two earths to peas.

§. 37. Farmer Lake adviſed me by all means to give two earths to my peas: he ſaid, if my land was like his, or the land about them, he was ſure I ſhould not often have a good crop on one earth.—Quære about this.---Farmer Biggs ſays, if it be lay-land, it will not come in tilt at two earths, but will turn up whole, and, if it be barley or oat-ſtubble, it will not need it; but he allows, it may be good practice as the ground may work, for ſometimes ſuch ſtubble-land may not work kindly under two earths. Farmer Elton afterwards told me what Biggs ſaid was true, but it was upon land lying ſtill a year or two that two earths was ſuch good huſbandry, and in that caſe it would come to tilt at two earths.

Three earths to ſtrong land.

§. 38. If you give ſome of your wheaten lands three earths, if ſtrong clay, it will turn much to advantage, but then ſuch land muſt, if run to a ſword, be fallowed in winter; otherwiſe the graſs will not rot ſoon enough to be ſtirred: in ſuch caſe you need not doubt of being able to ſtir ſuch fallows in the drieſt time, when you cannot get the ſull into the graſſy grounds you would fallow: by this means you will be able to cut out work for the moſt precious time of the ſummer, when farmers lie by, becauſe they cannot eaſily plough by reaſon of the hardneſs of the ground.

Advantage of three earths to ſummer-corn.

§. 39. The advantage of giving three earths to ſummer-corn is in this very manifeſt, viz. that in a dry ſpring and ſummer, in any part of a ground that works rough, for want of making the earth fine by ſo much ploughing, in that part the corn will come up edge-grown, and later than the reſt of the ſame ground where it worked finer, and apparently thinner in ſtraw, and ſhorter in ear, as was viſible anno 1704 in moſt grounds, which might have been prevented by giving three earths;—for if the corn in ground working rough comes up the later, it is conſequently the backwarder, which is a great diſadvantage in our cold hill-country, where it is of the utmoſt conſequence to have our corn early ripe.

Cuſtom in Leiceſterſhire, and of the worm there.

§. 40. In the incloſures in Leiceſterſhire, where the land is freſh, the way is to have four ſucceſſive crops without either dunging or folding; and then to lay down to graſs, laying pot-dung on the laſt ſtubble: viz. they take three crops of barley and one of wheat; they harrow always on one earth; and plough not up for barley till January or February.—Becauſe, as I ſuppoſe, the land being deep, would be apt to run to weeds, on longer reſt, before ſeed-time.—In theſe incloſures they never rake a wheaten crop firſt: it ſeems in freſh broken-up ground both the wheaten and the barley crops are ſubject to be eaten by a worm, as the wheat is in the Iſle of Wight: to prevent which Mr. Clerk eats the graſs as cloſe as he can, for that being turned in, as he thinks, occaſions the worm.

Of ſtirring poor land early for wheat.

§. 41. The workmen that were flinging out dung for me ſaid, I might ſtir my land in the laſt ſtirring three weeks or a month before I flung in my wheat, and this was a frequent practice. I talked with an old experienced farmer about it, but he ſeemed by no means to allow it for poor land that had been often ploughed; for it would, by giving it it's laſt ſtirring ſo early in the year, be apt to run abundantly to weeds; yet, ſaid he, for freſh or lay-land it may do very well.

Of ſtirring land.

§. 42. I obſerve many farmers ſcrupple ſtirring their ground before ſeed-time (the ſucceſs whereof nevertheleſs they doubt of without it) either out of covetouſneſs, or a fancy of not having leiſure to do it then, tho' at ſuch times teams may be hired; and yet at ſeed-time, when time is ten times more precious, they ſhall beſtow the ſame time in harrowing it, by reaſon of it's roughneſs, and, after all, the ground ſhall not work ſo well, nor lie down ſo fine as it ought to do.

If you propoſe to ſow the ground you fold for barley the laſt in the ſeaſon, have a regard to the ſtirring it, eſpecially if it be a ground any wiſe inclinable to graſs, for it is not to be ſuppoſed but the winter folding has eſtabliſhed ſuch a root of graſs, by inriching it, as is not to be overcome by ploughing up the ground, after being fallowed ſo late as the latter end of April or May, by which time the graſs muſt have gained a good root, which will not eaſily be torn aſunder from the earth by harrows, and conſequently will be apt to grow, and the ground not to work fine.

If you ſummer-fallow for barley, it is beſt to ſtir about two months before ſeed-time, to kill the roots of the green weeds that are come up, by turning them up to the froſts, and burying their leaves and ſtalks; beſides ſuch ground, being ſo thoroughly mellowed by the ſummer-fallow, is ſo ſeparated in it's parts, that it will not eaſily fall cloſe and heavy before ſeed-time, tho' ſtirred two months before.—But if you have winter-fallowed for barley, and intend to ſtir, if the ground be ſtill ſtiff, you ſhould ſtir the earlier to mellow it with the froſts; but if the ground be pretty fryable before ſtirring, the later you ſtir it the better, for then it will break the ſmaller at ſeed-time, having the leſs time to ſettle; and true it is, with the antients, that land cannot be too fine for barley.

If ground, by ſpring-ſtirring and ſummer-fallowing, be made curiouſly mellow for barley at ſeed-time, tho' it will wet ſooner than barley-land that has had but one fallow, ſo it will alſo dry vaſtly ſooner; and if it be trampled on wet by the horſes, yet the ground being ſo fine and mellow, the corn will come through; whereas when ground works rough and wet, the unbroken clods bind and cover in the wet, and keep the corn cold and wet all the ſummer, nor can it come through, but lies cold all the ſummer; beſides, to work ground rough and dry at ſeed-time, tho' by much harrowing it may be made fine at top, yet it is to be conſidered, the corn has not a mellow ſoft bed, much of the land being buried in whole clods, as has been obſerved by the antient writers on huſbandry.

A neighbouring huſbandman carried me into his wheat, and ſhewed me three or four lands that he had ſtirred, whereas to the reſt he had given but two earths: the wheat he had ſtirred was as good again as the other, both in colour and thickneſs; the reaſon why ſtirring might be ſo ſerviceable was, that, when two earths only are given, the earth turned up to the ſun in the firſt fallow, and thereby mellowed and impregnated, is for the moſt part turned down and buried underneath the corn that is ſowed at the ſecond ploughing, but on the third earth, it is again turned up to the ſurface whereon the corn is ſown.

Of ſtriking furrows after harrowing wheat.

§. 43. The deſign of ſtriking furrows after harrowing the wheaten land, is to ſtrike the corn out of the furrows, wherein the corn generally dwindles, as being chilled ; to do this, when the fold is after to go over it, is needleſs, becauſe the ſheep will tread it in again ; but after the fold has run over it, it may be done.

For want of drawing a furrow after harrowing in of wheat the reapers at harveſt are at a loſs how to meaſure, and for a guide to work by.

Of trenching wet ground.

§. 44. Wet clay-grounds, that lie wet and ſoggy all the winter, will chop and grow ſtarkey all the ſummer, ſo that they will have peculiar infirmities in all ſeaſons : in my opinion, abundance of, and very thick trenching of ſuch lands will be a much cheaper, and more effectual improvement of them, than dunging ; but indeed no improvement can have effect before they are laid dry.

Of the TILLAGE of different LANDS.

Of ploughing ſtony land.
* Vid. p. 38. §. 1.
Of picking up ſtones. Arguments againſt it anſwered.

§. 45.* Mr. Hillman, a notable farmer at Thruxton, was againſt my picking up of ſtones, and ſaid, it was certain ground would fall finer under the plough which had moſt ſtones. To which I anſwered, that it was true, lay-ground, or graſſy ground, would break better on the firſt ploughing (at leaſt if the ground was wet) the fuller it was of ſtones ; for ſuch ground cannot ſo eaſily cling, nor bind when ploughed up, becauſe of the great number of ſtones ; but ground, that has no ſtones, will be made to work as fine at three earths, as the ground that hath ſtones, and will plough with a much narrower and finer furrow ſtanding upright and on edge than the ſtony ground will do, the furrow whereof muſt be carried broad, or elſe the tumbling of the ſtones will fill it up.

Different Tillage of dry and moiſt earths.

§. 46. Quinteny ſays, to dry earths I allow a large culture or tillage at the entrance of winter, and the like as ſoon as it is paſt, that the ſnows and rains of the winter and ſpring may eaſily ſink into the ground ; but to ſtrong and moiſt earths I allow but ſmall tillage in October, only to remove the weeds, and ſtay to give them a large one at the end of April, or beginning of May, when the fruit is perfectly knit, and the great moiſture is over.

Of ploughing huſky, looſe earth.

§. 47. If ground be of a huſky, wood-ſeary nature, in the parts of which is not a fit continuity, in ſuch earth there is a porous adheſion, through which both cold winds, and the ſun may penetrate, and in which, being of a ſpungy nature, as light as it ſeems to be, the water will lie and chill the ground, as it does alſo in heathy grounds ; to cure this evil, and bring it to a more ſolid body, the more you plough it the cloſer it will lie to the roots of the corn, and become more ſolid, being alſo rolled, or rather trod with ſheep ; for if in clay-land, notwithſtanding the great room a poſt takes in a poſt-hole, the ſame earth will with eaſe be rammed into the ſame hole again with the poſt, and even more if need were, becauſe in the digging it up the earth is broken into minuter parts, how much more is the huſky land above mentioned ſo broken by ploughing ; it being much more porous, and capable of being forced into a compacter and cloſer body in it's ſurface the more it is broken by the plough, and then trod with ſheep, or rolled ; whereas the roller, or ſheep, if it be ſowed on one earth, will not be able to compreſs the clods, nor ſqueeze the earth cloſe in the hollows.

Of the MANNER of PLOUGHING.

Of ridging land.

§. 48. I obſerved this year, 1711, it having been a wet and cold ſpring, that wherever in my clay-lands there was a little ſinking of the ground, on thoſe flats there was little barley, and that thin in body, the ground being too wet for barley: from hence it ſeems to me, it would be very good huſbandry to ridge and round up all the grounds that are cold clay on our hill-country, where the land is of depth to bear it; for, as the delving parts of the grounds are much too cold for barley, ſo the very healthy and drieſt parts of cold clay would be the kindlier for barley, eſpecially in ſo cold a country; whereas throughout this hill-country we all plough the grounds upon the flat, and thwart the furrows in ſtirring. It ſeems alſo to me, that this very good effect may proceed from ſuch ridging up the lands, viz. that the lands will on that account plough ſo much the drier and mellower in fallowing, and conſequently will at ſeed-time, (by turning up dry in fallowing) turn up dry and in powder; whereas, when the lands in fallowing are laid flat, they take in the wet, and lie wet all the winter, and when they come to be ſtirred at ſeed-time, they turn up too wet and cold for barley.

Of ploughing juſt before ſowing, not good for ſpring-corn.

§. 49. There is a practice in huſbandry of giving the laſt ploughing to grounds ſome time before ſowing them; which is, when ground is not in a proper temper for flinging in the ſeed and harrowing; this is done when perſons have a great deal to do, but, wanting a ſeaſon, they would prepare their grounds againſt one may happen; but this practice commonly meets with very different events in wheat, or winter-corn, and in lenten or ſpring-corn; for winter-corn, when prudently done, it is very good huſbandry; but ſeldom ſo, when practiſed for ſpring-corn, for the reaſons following. The reaſon of doing it for wheat is, becauſe the ſeaſon of the year being far advanced for ſowing wheat, and the land too dry to venture the ſowing (for wheat is ſeldom long hindered from ſowing by wet) the huſbandman gives the laſt ploughing in order to ſow wheat, that on the firſt rain he may commit the ſeed to the ground, and then harrow-in ſeveral acres in a day; whereas were he to plough for what he ſows he could diſpatch but little in a day: it is apparent this practice may be very good huſbandry; for the ground in this caſe is ſuppoſed to be ploughed very dry, and conſequently a fine bed, by breaking the ground with the plough, is not prepared for the growing of the ſeeds of weeds; for no ſeeds of weeds can make advances to get the ſtart of the corn till rain comes, and then the wheat will be ſowed, and be able to ſet forth as forward as the weeds; and hereby, when we are behindhand in ſowing our crop of wheat, much time is gained; which is a great advantage to a crop of wheat; but in the other caſe, ploughing beforehand for barley, or ſpring-corn, in order to ſow it when a ſeaſon comes, or the ground is in temper, muſt in all likelihood be improper huſbandry; becauſe, generally ſpeaking, we muſt in ſuch caſe be ſuppoſed to plough beforehand, becauſe the ground was too wet or too moiſt for ſowing barley, and then, a bed being prepared, and the ſpring and warm time of the year being advanced, the ſeeds of weeds will grow, if the ground were ploughed never ſo dry, yet if a glut of rain ſhould come, which will hinder you from ſowing, it will nevertheleſs make the weeds grow.

Of laying the furrows flat in the hill-country.

§. 50. Mr. Edwards aſked farmer Biggs, if he had not laid his ground too flat. Note, he had ſown it to wheat.—Farmer Biggs replied, conſidering what ſort of ground it was, it could not be too flat, it being a lightiſh ſort of ground.—I aſked, whether it was poſſible to lay the wheaten ground too flat in the hill-country of Hampſhire; farmer Biggs replied, if it was clay-cold-land, they looked on it beſt to round up the furrows a little,---and ſo ſaid Mr. Edwards.

Mr. Garnam, of Prior's-court, Berks, was alſo of opinion, that, if ground was any ways wet and cold, laying it a little round for wheat not only favoured the corn in laying it the healthier in the winter, but alſo, when the ſpring came, by lying healthier it would lie ſo much the warmer, and ſhoot away, tho' the ſpring ſhould prove wet and cold, and thereby avoid the blights the better; for laying corn dry forwards it as much as ſowing early.

It is the heat and warmth of the earth, occaſioned by the ſun and dry weather, that opens, looſens, and refines the vegetative parts, and cauſes them to breath up in ſteams into the plants; nor does the earth want moiſture for ſuch a purpoſe, provided it hath juſt enough for a vehicle ſufficient to convey thoſe corpuſcles; therefore all cold rains, or rains in cold weather, or wet ſogging in the earth, are great enemies to that vegetative power, and do chill, check, and lock up (inſtead of looſening) thoſe corpuſcles from aſcending up into plants, to the augmenting their bulks; from hence it may be collected, how reaſonable it is to lay the furrows of wheaten clay-lands up round, tho' they are in the hill-country; but, if they ſhould lie at all flat, yet ſo to contrive that they may not lie wet, longer than needs muſt be, under the cold winter or ſpring rains.

Lands being made very fine for wheat ought to be ſowed the later; becauſe, if early ſowed, many ſeeds of weeds, more tender than wheat, and too tender to grow at the latter end of September, will grow at the beginning of that month; and the bed of earth you have made ſo fine and fit for corn, will, you muſt conceive, be alſo fitter to bring up the ſeeds of weeds; and the later you ſow your wheat, if upon ſtrong land eſpecially, the more need is there to lay up your lands ſomewhat round, tho' the clay be of a healthy dry nature; for the drier the land lies the faſter the corn will come away, and keep growing the better during the whole winter, it lying the warmer for lying dry; whereas cold and wet are certain enemies to vegetation.

Of large furrows.

§. 51. Mr. Edwards was ſaying to me, that it was a great error to turn up too large a furrow, and that ploughmen, that they might be thought to have done a good day's work, were very apt to do ſo, whereas it was more profit to turn up as narrow a furrow as they could, tho' leſs land were ploughed.--

Of this I ſpoke afterwards to farmer Biggs; he ſaid, it was true; the ſmaller the furrow the better; but in lay-land, if ſtiff, it would not turn up ſmall, but ſtand an end, if the ploughman endeavoured to turn it up ſmall; but, ſaid he, in oat-ſtubble, or barley-ſtubble, that work light, the ſmaller the furrow the better.

Mr. Edwards having told me, that it was a great fault in ploughmen, out of greedineſs to ſeem to have done much, to turn up large furrows at ſeed-time, and it ſeeming good reaſon to me, becauſe, the more and narrower the furrows the more the corn, the corn coming up for the moſt part, in the furrows.---I aſked alſo Thomas Elton about it, a very underſtanding huſbandman, and he ſaid, he could never for his part ſee the ſenſe of fallowing, and taking pains all the year, to loſe a third or fourth part of one's crop at laſt by a large furrow.---I aſked him then, what furrow was beſt in fallowing; he ſaid, if ground worked fine, a large furrow would do well, and turn up ſmall enough at it's ſecond earth; but, ſaid he, if it fallows up heavy and rough, and be turned up in a large furrow, it will not be brought to be fine by ſeed-time; therefore ſuch land ought to be fallowed with a ſmall furrow.

Quære, If the narrower the furrow in fallowing of ſtubble ground would not be the better for barley, as well as in the laſt ploughing in ſowing-time? becauſe the narrower the furrows the more power the froſts and dry weather would have over them, and the more upright the more hollow they ſtand; whereas the broader the flatter, and more apt to receive the wet, and the more the furrow holds in breadth the leſs does it break. I know in whole land, that is graſſy, it is otherwiſe, for, if ſuch land be deſigned for a fallow, unleſs one furrow flap over the other, the graſs will live between the furrows, and not rot, and if ſuch land is to be ſowed on one earth, if the furrows lie upright, the corn muſt fall between.

I ordered my head-ploughman to fallow for barley in a field, which being proper to be ploughed the ſame way again, as I fallowed it, I thought it might not plough ſo fine at ſowing it, as if I had thwarted it; ſo I gave him a caution, not to fallow it rough, but to turn up a little furrow.—But he ſaid, a large furrow would be beſt, becauſe that will be ſplit or divided in ſeed-time, but if he ploughed a fine furrow now, and ploughed the ſame way at ſeed-time, a narrow furrow could not be ſplit in the middle, but turn back again whole.

I was ſowing barley on wheaten-fallow, and, as you plough up-hill and down, the plough alſo goes along-ſide part of the hill; as I was in the field obſerving this ploughing, my bailiff ſaid, the plough going on the ſide-long could not carry ſo narrow a furrow as otherwiſe it might, for, if they ſhould go to plough a very narrow furrow, they could not hold the plough in, but the hill-ſide would be often caſting it out; on the other hand, when the plough turns, and the broad board goes againſt the ſide of it, it is as hard to keep a narrow furrow, the hill being apt to fling the plough off.

Of PLOUGHING with HORSES or OXEN.

Stiff land ploughed cheaper with ſix horſes than four.

§. 52. My carter ſays, that wherever one ploughs ſtiff land, or lay-land, or hilly land, it is cheaper to maintain ſix horſes, and drive them in the plough, than four; for, ſays he, four cannot be ſuppoſed at moſt to plough above an acre in a winter's day, and ſix will go away ſo faſt with it (it being ſo much eaſier to them) as to plough near an acre and half per day; and then beſides the horſes need not that proportion of oats, their labour being eaſy. A farmer ſtood by and ſaid, he believed the ſame; if ſo, the two horſes will well pay for their keeping.

I ſummer-fallowed for barley, and hired a farmer to fallow with four horſes, and I fallowed myſelf with other four; but the ſeaſon being very dry, and the ground having laid two years to broad clover, and being ſtony withal, I found they made but a ſlow riddance, inſomuch that I believe, a plough and ſix horſes would have ploughed as much as thoſe two ploughs; and beſides, they, by being weak, were forced to plough the ground ſcragling, inaſmuch as the ploughman was forced to wriggle with the plough, where the ſull ſtopped at any ſtones, to help the weakneſs of the horſes, by means of which we could not hold a ſteady and even furrow neither in breadth nor depth; and as his plough did conſequently often jump out of ground, ſo he was at a great deal of pains and care to get it in again; whereas a plough with ſix horſes goes through thick and thin, and will carry an even furrow by flinging and forcing up all ſtones in it's way; ſo note, againſt the next time, in like caſe, the advantage of ploughing with ſix horſes.

Advantage of oxen.

§. 53. One advantage in a team of oxen is, that one of the men who go with them may go about other buſineſs when ploughing hours are over, for one man is abundantly ſufficient to look after ſix oxen.

Mr. Baily of Wiltſhire very ſtrongly perſuades me to keep a plough of oxen together with my horſe-plough: he confeſſes an ox-team cannot go to market, in a country where horſe-ploughs are kept, becauſe of the ruts they muſt tread into, but for carrying out dung into the fields, ploughing, and harveſting, they will do as well as horſes. He ſays the ſhoeing of an ox round, comes to 16 d.—but if the inner hoofs behind are not ſhod, (which in our country they need not, not going on the roads with them) four oxen in ſhoeing are but the price of three. He ſays they will endure eight hours ploughing in the day, in winter, with ſtraw only, till towards Lady-day, and then they muſt have hay; and if they are kept up, they will go as faſt as a horſe-plough. And he ſays, in the very winter they may be turned out into the backſide to ſtraw after their day's work, and will not take cold; but I believe in our country ſuch uſage would be too cold: Mr. Biſſy was preſent, and agreed to all this,—and both of them held, that, if fatting oxen ſtalled were over-bound in their bodies, which by being kept hot they might be apt to be, they muſt be turned out to the air, for, whilſt bound, they will not thrive.

An advantage of ploughing with oxen is, that you ſummer-fallow the ſtrongeſt lands with them in the dryeſt ſeaſon (their chains being ſtrong) by making a plough of ten oxen, and adding a ploughman the more to hold down the plough; whereas, if at ſuch time you make a plough of eight horſes, they will not carry ſo true a furrow, and will break their harneſs.

HARROWING.

Of the ſarrition of the antients.

§. 1. THE Romans, after the ſeveral fallowings before mentioned, ſowed their grain, and, if they found occaſion, harrowed it, and then, as it ſeems to me, turned it under furrow, tho' I do not remember that any of their writers ſpeak particularly of ſowing under furrow, or on one earth; I think they are ſilent in theſe matters. When this was done, and the corn was come up, they proceeded to another operation, which they called ſarrition, a kind of harrowing or raking with [a] wooden or iron rakes, for they are both either mentioned or intimated by Columella.—[b] This ſarrition was performed in dry burning lands before the winter came on, and then they covered the blade intirely by raking the new earth over it, taking however what care they could not to wound or mangle the roots.--This, they thought, protected it from the cold, gave it freſh nouriſhment, aſſiſted it in it's growth [c], and made the roots tillow and ſpread.---When the rigor of the winter was over (in January, according to Palladius, and in February according to Pliny, and in dry but not froſty weather) they raked it a ſecond time, in a ſlighter manner, or a different way;--- [d] But in cold wet land they uſed only the ſpring ſarrition, raking the earth ſo as not to bury the blade, leſt the young ſuckers or tillows ſhould be thereby deſtroyed.--- [e] The great uſe of this later ſarrition was thought to lie in it's looſening the ground which had been bound up by the winter's froſts, and thereby giving an eaſier admiſſion to the rays of the ſun.---They made it a rule however, let the ſeaſon be never ſo favourable, not to uſe this huſbandry [f], till the corn was grown to that height as to equal the tops of the furrows.---Wheat was thus harrowed when it began to have four leaves, barley when it had five, beans, and the reſt of the leguminous kind, when they were four fingers high.---The earlier ſarrition would by no means be proper in our wet climate; [g] and indeed this method of huſbandry, both of the earlier and later kind, tho' in frequent practice among the Romans, was thought by many to do rather harm than good, inaſmuch as it often wounded the roots of the corn, or laid them bare to be killed by the froſts.---When their ſarrition was finiſhed, they pulled up by hand the weeds that theſe harrows had left remaining, and this they termed runcation.

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[a] Ligneis raſtris ſarriendus. Colum. de medicâ.—Ferro ſuccifa emoritur. Id. de lupino.

[b] In agris ſiccis et apricis, ſimul ac primam ſarritionem pati queant ſegetes, debere eas permotâ terrâ obrui, ut fruticare poſſint, quod ante hyemem fieri oportere, deinde poſt hyemem iterari.—Sic ſieri debet ut ne radices ſatorum lædantur.

[c] Ut latius ſe humi frutex diffundat.

[d] In locis frigidis et paluſtribus plerumque tranſactâ hyeme ſarriri, nec adobrui, ſed planâ ſarritione terram permoveri.---Cum pullulare deſiit frumentum, putreſcit, ſi adobrutum eſt.---Columella.---Qui ſarriat, caveat ne radices frumenti ſuffodiat.---Plin. lib. 18.

[e] Sarculatio induratam hiberno rigore ſoli triſtitiam laxat temporibus vernis, novoſque ſoles admittit. Plin. lib. 18.

[f] Cum ſata ſulcos contexerint. Columella. (Sulcos æquant ſata. Virgilius.) Triticum ſarritur quatuor ſoliorum, hordeum quinque. Palladius et Columella.---Faba et cætera legumina cum quatuor digitis a terra extiterint. Columella.

To ſteel the tinings of your drags.

§. 2. Mr. Hillman being with me, when I ordered the ſmith to make tinings to my drags, he perſuaded me to have the tinings ſteeled, aſſuring me it would five times over-pay.---Qu. why not ſteeled tinings to harrows?

Of harrowing with oxen.

§. 3. It is ſome diſadvantage that oxen will not make any great diſpatch in harrowing, nor will the ſlow manner of their drawing the harrow about do great ſervice, if the furrow tear not eaſily; for the harrows drawn ſlowly ſlide over the hard earth; whereas, when drawn apace by horſes, they jump, and whatever the tinings or teeth catch hold of they tear through; but in mellow rotten ground, where the harrows eaſily enter, there you may make good work with oxen.

Caution againſt the fraud of ox-hinds in dragging.

§. 4. Sometimes in dragging-in of corn, eſpecially by oxen, where the chain, which is faſtened to the drags, may be taken up and ſhortened, as the ox-hind pleaſes, if you have not an eye to your ox-hind, he will be apt to ſhorten his chain ſo, that it ſhall lift up a row or two of the hither or fore-tinings, and ſo but a ſmall weight will lie on the hinder row of tinings, whereby the drag will, for the moſt part, be born up from the ground, ſo that the firſt row, and it may be the ſecond, ſhall not enter the ground, nor the hindmoſt row go deep enough; and this the ox-hind will do, if not well looked after, for the eaſe of his cattle; becauſe they draw abundantly leſs weight, when the foremoſt rows of tinings are lifted up from the ground, than when the chain the oxen draw by is ſo lengthened out, that every row of tinings may lie plumb and flat on the ground, and have liberty thereby, not being held up, of ſinking in the deeper; whereby the corn is alſo laid the deeper, and the ground torn the better: the ox-hind's ill practice in favour of his cattle is ruinous to the maſter, and therefore ſervants are to be well looked after: an hundred pounds by this abuſe may ſoon be loſt in an hundred acres of corn ſowed on one earth.

What number of harrows beſt for ſtiff land.

§. 5. Where land has been ſummer-fallowed for barley, two harrows will harrow it as well as four harrows will harrow land winter-fallowed for wheat.

It is agreed, that three harrows will do more ſervice than four going two and two, for the third harrow contributes much by it's weight in keeping down the other two.

§. 6. If

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[g] Quidam negant eam quicquam proficere, quod frumenti radices ſarculo detegantur; aliquæ etiam ſuccidantur, ac ſi frigora inceſſerint poſt ſarritionem, gelu frumento enecentur. Subjungenda eſt deinde ſarritioni runcatio.

Manner of harrowing ſtiff land.

§. 6. If furrows be ſtarky and ſtiff, ſo that there may be danger of turning them back again, in thwarting them with the harrows, if one harrow them not directly athwart, but aſlant, that danger will be prevented.

Caution againſt harrowing too wet.

§. 7. It is to be obſerved in harrowing, tho' the ground may harrow well enough at top, whether it may not be ſo wet underneath, as for the horſes to tread the ſeed in too deep, and into ſuch paſte and mortar, that it cannot ſhoot it's blade through.

It is a common piece of ill huſbandry, when the ſpring-ſeaſon of ſowing proves wet and rainy, and there may be a ground under harrowing that may want but the laſt tining or two, (perhaps an hour's, or but half an hour's work of being finiſhed) when a hard ſhower of rain ſhall come, and the ground harrows wet, to continue harrowing, out of covetouſneſs of finiſhing that ground, and unwillingneſs to leave ſo little behind undone, and to come again to that ground, when the next work they are to go upon lies perhaps a mile, or half a mile off; but ſervants ſhould have moſt expreſs charge giving them, as a general rule, at the beginning of ſeed-time, immediately to ſtop and deſiſt harrowing, if the ground harrows wet and dauby, eſpecially in clay-ground; for, tho' the ground harrowed never ſo well before a ſhower of rain came, yet the taking one turn more with the harrows, while the ſurface is wet, will make it cruſt and bake ſo, that if dry and windy weather come, the corn will have a difficult paſſage through.

Of harrowing ſtony bottoms.

§. 8. I ſowed a field anno 1703 with oats, having fallowed it very early; the winter proved wet and rainy, which beat the ground very flat; but, being in good heart, it was apt by ſowing-time to ſhew graſs; and particularly in the bottom of that ground, that being very ſtony, as well as beaten flat by the great rains, the harrows could not raiſe a * grete; therefore, tho' in the hill-country ſuch grounds are the beſt, yet that bottom brought me more graſs than oats; wherefore it is to be remembered, that ſuch bottoms be ploughed up again at ſeed-time, and care ought always to be taken, that ſuch bottoms lie light, when to be ſowed, that the harrow tinings may be let in.

* mold or ſtaple.

I had wheat anno 1706, which I ſowed on one earth, and tho' the bottom of the ground was as good as any of the reſt, yet the wheat was not above half as good, neither as to thickneſs, nor the proof it was in: the reaſon muſt be, becauſe, the bottom of that ground being very ſtony, the tinings of the harrows rid upon the ſtones, and ſo the corn was never well healed.—Therefore, when ſuch grounds are ſowed with wheat on one earth, I adviſe that the ſtony bottoms be ploughed ſome time before, ſo that they may come to be thwarted, and ſowed under furrow, when the other land is ploughed and ſowed to one earth.

Much harrowing, no cure for ground ploughed rough.

§. 9. I can ſee but little cauſe for the ſatisfaction the farmers ſeem to have, in fancying if a ground works rough, that fault may be cured by much harrowing; for thereby the lumps are buried, and, for the moſt part, the corn under them, there being only a fine ſmooth mold gained at top, by the ſcratching of the harrows.

§. 10.

To drive ſheep over wheat raiſed out of the ground by harrowing.

§. 10. Having harrowed a field of my wheat, and endeavouring to give it three or four tinings more, in order to fine off ſome of the rougher part, they brought up a great deal of grain, that in three or four tinings before they had buried: I adviſed with farmer Biggs, and propoſed to rake them in: he ſaid, the beſt way by much, and which in ſuch caſes they uſed, was to drive their ſheep over the ground, which would prick them in.

Of harrowing peas.

§. 11. It is beſt to let the furrows lie three weeks or a month, after ſowing peas, unharrowed; the furrows keep the cold and wet from the corn; whereas, if by that time the peas be rooted, they will not have ſprouted out, and then the harrows will not hurt them.

Of dragging.

§. 12. In talking with a notable farmer in Wiltſhire on the ſubject of ſowing broad clover with oats, he told me, he always dragged them in with their country drags (which are not ſo big as ours, and have but ſix tinings on a harrow) and this he does, tho' his ground had been ploughed up but a fortnight before; but he commonly ſowed broad clover on ground ploughed ſo long before as Candlemaſs, which never will, tho' it works mellow, fall too cloſe for the drags to tear it.—Here note, if dragging does ſo much better with them than harrowing, even in ground that would, as we ſhould think in Hampſhire, tear well with harrows, it muſt do better with us, becauſe we do not plough ſo deep as they do in Wiltſhire, nor will the tinings of the drags go ſo deep with us as with them, on account of the ſtones, and ſo we can be in no danger or fear of burying oats or barley. The farmer ſays, he ſows very little or no barley without dragging it, and the like he does to wheat too after he has ſown it, tho' on a ſecond earth; nay, he often drags the ground once, when ploughed the ſecond time, before he ſows either wheat or barley, in order to break the furrows and the ſeams, that the corn may come up the more * ſuant; and on the backs of the furrows, which are dragged after the corn is ſown, there is no fear but the drag-tinings will let it in deep enough.—To make wheat come up more ſuant, when ſown on one earth, or on ſtale fallows, he always drags it firſt, before it is ſowed, and then gives it two or three tinings, and ſays, there is no fear but the drag-tinings will let the corn in deep enough.—This method of dragging wheat and barley land, in any of theſe reſpects, before you ſow it, ſaves ſeed: for you may ſow leſs on an acre.—It is a general fault in Hampſhire, that, having ſo much to do, we ſlubber it over without dragging when it ought to be dragged, and content ourſelves with only harrowing the ground, and, when we either drag or harrow, we do not beſtow labour enough on it in either reſpect.

* kindly.

PICKING UP STONES.

Advantage of picking up ſtones. Vide §. 45. of Ploughing.

† mold or ſtaple.

§. 1. THE advantage of picking up ſtones in clay-land is, that, the ſtones being picked up, the ground harrows much the better; the number of ſtones and their bigneſs bearing up the harrows from reaching the † grete, and making the ground plough rugged; nor can a weak plough turn it up but to great diſadvantage, every ſtone being a harrow-reſt; beſides, to plough ſuch ground true, there muſt two men go with the plough, for a man and a boy are not ſufficient, it being too tireſome for one man to hold the plough all day, a man's weight being neceſſary to keep the plough in the ground.—It is to be noted that, where ground is trod much by cattle, eſpecially that part of it that they go moſt in and out on, or where carting has been, the ploughing is very ſtiff.

The better raking up the barley is another motive for picking up the ſtones to be added to the former.

Another advantage of picking up ſtones is, that thereby the plough turns up freſh earth by going deeper: the very weight of the ſtones (where there are many) contributes to the ſettling and binding of the earth to great prejudice after rains.

The advantage of picking up great ſtones at leaſt appears from the inconvient rolling of wheat in March or April; for the roller is always riding on one ſtone or other, which it cannot ſqueeze in, and, in that caſe, is born hollow throughout it's whole length from compreſſing the ground.

Another advantage of picking up ſtones is, that, if it be clay-lay-land, and ploughed dry, which for wheat is to the advantage of the land, the plough-beam, ſprinter, whippings, and traces muſt often break when they come againſt a great ſtone, as my neighbour experienced this ſummer (anno 1704) who ſaid, they broke in one piece of ground as much plough-tackle (even their beam, tho' new, &c.) as came to the value of every day's work.

Another advantage of picking up great ſtones in arable land is, that a leſs roller, with fewer horſes, will roll the ground in ſeed-time.

Another advantage of picking up ſtones is, that, at a day's notice, one may take the advantage of the times in hayning up for mowing, after one has waited for the fatting cattle on one's land, and found by the markets riſing they muſt be bought in too dear; but, if an hundred load of ſtones muſt be firſt picked up and carried away, it will render that method impracticable.

Not to pick up ſtones from poor land.

§. 2. To pick up ſtones from poor land, continued in that condition, I look upon rather to be impoveriſhing than improving it; for thereby you rob the poor land of it's only dependance, which was being kept moiſt; for, if ſuch ground has not moiſture to bring up the corn, it muſt fail, having no ſtrength; of rich land I believe juſt the contrary, and that ſuch abundance of flints, which lie ſo thick, or are ſo broad as to keep the dews and the ſun from impregnating the ground, muſt needs be to it's prejudice.

If a multitude of ſmall ſtones lie on light white ground, the evil whereof is being ſubject to be too light, it ſeems good to let them remain, that the weight of them may compreſs the ground together (for which reaſon they are prejudicial to clay-land) and wedge themſelves with the ground, which ſecures it from burning, &c.—But great ſtones are every where pernicious.—[d] In Sicily, near Syracuſe, ſays Pliny, a farmer, who was a ſtranger to that kind of land, and to the manner of huſbandry in thoſe parts, loſt his crops by picking up the ſtones, and found it ſo great a diſadvantage to his land, that at length, to retrieve his damage, he thought it adviſeable to bring them back again.—The ground was light there, and, I ſuppoſe, they had not the uſe of rollers in thoſe countries; nor do I find that Cato, Varro, Columella, Palladius, or Pliny make any mention of a roller for their lands, but only of a cylinder to roll their earthen barn floors hard, and a crates, or flat frame of timber, to draw over their corn, and level their ground.

Stones hinder wheat from tillowing.

§. 3. Quære, whether an abundance of ſtones in a ground may not hinder the tillowing of wheat at ſpring, by bearing the root off from the earth, and hindering it taking freſh root, and not ſuffering the roller to preſs it to the earth.

Keep the roots from the benefit of the ſun.

§. 4. To the diſadvantage of ſtones in grounds may be added, that though the corn under them comes up, yet, where the root is hindered from the ſun, ſuch corn muſt be thin; and, when corn lies under ſtones, ſhaded from the ſun, I ſuppoſe it not only to be thinner in grain, but ſhorter in ear, and to carry leſs and fewer tillows under the ſtones than if expoſed to the ſun and air.

Nor in the bottoms, where ſo many ſtones generally lie, do the ſown graſſes, ſuch as clover, &c. come to any thing, tho' the ground is allowed to be much the beſt; if ſuch a ground of twenty acres has ſuch a bottom of two or three acres, and it ſhould coſt ten pounds ridding the ſtones, the advantage to the clover in thoſe two or three acres would, I believe, pay the whole charge.

SOWING.

Of choice of ſeed among the antients.

§. 1. [a] THE beſt ſeed, ſays Pliny, is that of a year old; if you keep it to two year old it is not ſo good, but, if to three, it is worſe ſtill, and, if it be older than that, it will not grow. [b] For ſeed you ſhould chooſe the heavieſt corn, and fulleſt ears, and ſet them apart in the barn, and by no means admit thoſe ears that are not full throughout, but have only grains here and there by intervals. Note the curioſity of the antients, and it ſtands to reaſon; it is in danger of producing ſuch ears.

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[d] In Syracuſano agro advena cultor, elapidato ſolo, perdidit fruges luto, donec regeſſit lapides. Plin. lib. 17.

[a] Semen optimum anniculum, bimum deterius, trimum peſſimum, ultra ſterile. Plin.

[b] Ad ſemen reſervandum eſt quod graviſſimum: quæ ſpica per intervalla ſemina habet abjicietur. Plin.---Quæ ſeges grandiſſima, atque optima fuerit, ſeorſum in arena ſecerni oportet ſpicas, ut ſemen optimum habeat.—Varro, ſect. 56.

Quantity on an acre.

§. 2. [c] Pliny directs thoſe that ſow early to ſow thick, as the corn will be longer in coming up; and the later ſown corn, he ſays, ſhould be ſown thin, leſt it ſhould be deſtroyed by coming up too thick on the ground: but ſurely he muſt mean this of the ſpring-corn and not the winter-corn, for the direct contrary rule holds in ſowing wheat.

Time of ſowing.

§. 3. [d] According to Cato, cold wet land ſhould be ſown firſt, and the warmer and drier ground be reſerved to be laſt ſown.—This he muſt mean of a winter-crop. Pliny and Palladius give the like rule: ſee alſo a ſubſequent remark of mine on a paſſage in Columella.

Of the ſeaſons of ſowing various grain, and the quantity among the antients.

§. 4. [e] In the month of November, ſays Palladius, we ſow wheat and barley, and of wheat five modii to an acre; Columella's directions are, four modii of wheat, five or ſix of barley, three of peas, and ſix of beans, which I wonder at. So that a modius, as above, being near half a buſhel, they ſowed above two buſhels and a peck on their acre; which is as much as generally we ſow in good ground; but then it muſt be conſidered, that they ſowed in November, and we in September and October.--- [f] But Palladius ſays in his calendar of September, In this month, in wet, barren, and cold ground, and in places ſhaded from the ſun, wheat ſhould be ſown, in clear ſerene weather, about the time of the æquinox, that the roots may have time to grow ſtrong before the winter.— [g] Speaking of September, he ſays, This is the firſt ſeaſon of ſowing vetches to be cut up for food, and the quantity to be ſowed is ſeven modii on an acre.— So that 'tis plain they ſowed vetches two months before wheat, and ſowed ſeven modii on an acre; which is above three buſhels. But in his calendar of January he ſays, In this month we ſow vetches for ſeed, and not to be cut up for food;—which ſeems to agree with what I have in another place obſerved, that the ſeed of a plant is the tendereſt part of it: and ſo Columella, lib. 11. ſ. 9.—[h] Of the month of May Palladius ſays, At this time moſt corn is in flower, and the farmer muſt by no means ſuffer it to be meddled with. Wheat and barley, and all ſeeds that are ſingle, and do not ſplit, are eight days in flower, and afterwards forty days in growing to maturity; but ſeeds that are double, ſuch as beans, peas, and the reſt of the leguminous kind, are forty days in flower, and are coming to perfection during the ſame time.

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[c] Feſtinatâ ſatione denſum ſparge ſemen, quia tardè concipiat, ſerotinâ rarum, quia denſitate nimiâ necetur. Plin.

[d] Ubi quiſque locus frigidiſſimus, aquoſiſſimuſque erit, ibi primum ſerito; in calidiſſimis locis ſementem poſtremo fieri oportet. Cato, ſect. 34. fol. 8.—Sationem locis humidis celerius fieri ratio eſt, ne ſemen imbre putreſcat, ſiccis ſerius, ut pluviæ ſequantur, ne diù jaciens, et non concipiens evaneſcat. Plin. lib. 18. fol. 300.

Frigidis locis autumnalis ſatio celerior fiat, verna vero tardior.—Pallad. lib. 1. fol. 60.

[e] Novembri menſe triticum ſeremus, et hordeum: jugerum ſeminis tritici modiis quinque tenebitur. Pallad.---Tritici quatuor, hordei modios quinque vel ſex, piſi modios tres, fabæ ſex. Colum. lib. 9. fol. 9.

[f] In hoc menſe, uliginoſis locis, aut exilibus, aut frigidis, aut opacis, circa æquinoctium triticum ſeretur, dum ſerenitas conſtat, ut radices frumenti ante hyemem convaleſcant. Pallad.

[g] Nunc viciæ, cum pabuli cauſà, prima ſatio eſt; viciæ ſeptem modii jugerum implebunt.

[h] Nunc omnia prope quæ ſata ſunt, florent, neque tangi a cultore debebunt. Florent autem ſic: frumentum et hordeum, et quæ ſunt ſeminis ſingularis octo diebus florebunt, et deinde per dies qua-

[i] Columella, lib. 11. f. 9. has theſe expreſſions; It is an old proverbial ſaying among the farmers, (a) early ſowings often deceive us, (a) late never.--We lay it down as a rule therefore, that thoſe places, which are naturally (b) cold, ſhould be ſowed firſt, and thoſe that are (b) hot, laſt.

Depends on the climate, and is no rule for us.

As to the former expreſſions, (a. a.) they wholly depend on the clime whereof they are ſpoken, viz. Italy,—where they uſed to ſow wheat and barley in December: no wonder therefore, if an earlier ſowing, where the corn indures the whole winter, oftener miſcarries than a later ſowing, where it indures but half a winter: nor could they well ſow too late, in another reſpect; becauſe their corn was ripe the beginning of June, that was ſowed in December; what harm then can enſue from it's being ſown in January or February? for then it will be ripe in July, which is before it can ſuffer by a cold autumn.—It is plain therefore, it would be very dangerous to import this Italian maxim into England; becauſe we may eaſily ſow too late: for our ground being poorer, if we ſow it in May, which is the latter ſeaſon of Engliſh ſeed-time, it may often be ſo dry, as never to bring up the corn, and what may be brought up, if the ſummer be cold, will never ripen kindly; ſome ſort of ſtrong fat lands, and even ſome cold gravels, may carry it out ſo late ſown.---The latter expreſſions, (b. b.) are alſo purely ſouthern, and would deceive an Engliſhman; but no wonder it was beſt in Italy to ſow their cold land firſt, whether for wheat or barley; for directions are given by Palladius to ſow ſuch wheaten-lands, in September and October;---And thoſe months, and November and December, are drier months than January and February; therefore heavy ſtrong ground may be expected to work better, and the flinging corn into a dry warm bed, eſpecially if land be cold, is of great conſequence, whatever weather may come after: and the ſeaſon of ſowing their hot land is as judiciouſly choſen in January and February, which are wetter.—But this general practice would be deſtructive to paying rents in England; for the beginning of our barley-ſeaſon being in March, and the beginning of April, and the grounds ſatiated with winter-rains, 'tis then commonly the wetteſt ſeaſon, and conſequently cold lands ought not then to be ſown, but hot lands; and therefore with us, in that caſe, the order in huſbandry is plainly to be inverted.

The antients ſowed more corn on an acre than we do.

§. 5. If it be well conſidered, that a Roman jugerum is but little better than half our acre, and their modius a little leſs than half our buſhel; we

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quadraginta grandeſcunt, uſque ad maturitatis eventum; quæ verò duplicis ſeminis ſunt, ſicut faba, piſum, cæteraque legumina, quadraginta diebus florent, ſimulque grandeſcunt. Pallad.

[i] Vetus eſt agricolarum proverbium, maturam (a) ſationem ſæpe decipere ſolere, (a) ſeram nunquam;--- Itaque in totum præcipimus, ut quiſque naturâ locus (b) frigidus erit, is primus conſeratur, ut quiſque calidus, (b) noviſſimus. Columella. lib. 11. fol. 9.

ſhall find that the Romans, ſee their Rei ruſticæ ſcriptores, did ſeed their grounds more than we do, notwithſtanding they ſowed better land, and it lay ſo much warmer than our's.—A modius is 26 lb. 8 ounces.

[k] Pliny orders to ſow in an acre, (which is but little above half our acre) of wheat five buſhels, (each little better than half our buſhel) of barley ſix modii, of beans a fifth part more than of wheat, of vetches twelve modii, which I think very ſtrange; of chick peas, and chicklings, and peas three modii, which is equally ſurpriſing.

Time of ſowing.

§. 6. Sharrock in his book of Vegetation, ſpeaking of the ſeaſon of ſowing, ſays, fol. 10. The moſt natural time of ſowing is that which nature itſelf follows, viz. when the ſeeds of their own accord fall into the ground.

Time of ſowing in the northern countries.

§. 7. In the ſecond volume of Collections of travels it is ſaid, that in Muſcovy, as well as in Ingerland, Carelia, and the northern parts of Livonia, they do not ſow till about three weeks before Midſummer, becauſe the cold, which has penetrated deep into the earth, muſt have leiſure to thaw, notwithſtanding which, their harveſt is over in Auguſt, the ſun, which remains ſo long above their horizon in ſummer, ſoon ripening their corn; [l] but the Livonians are forced to dry their's by the help of ovens in the barns, after it is brought in, which is ſubject to many inconveniencies, and make their corn unfit for ſeed, whereas, the Muſcovites carry in their's dry and fit to be threſhed, fo. 18.

Of ſowing up and down-hill.

§. 8. A ſeeds-man is much leſs apt to ſow too thin going up and down-hill than on a level, becauſe, when he takes his turn up-hill, his ſteps are always ſhort, and his hand muſt caſt corn at every ſtep; again, going down-hill it is painful to take large ſteps.—My carter and ſeeds-man are very poſitive in this point, and to me it ſeems reaſonable.

Of a ſeeds-man.

§. 9. If your ſeeds-man in the caſt of his hand back drops pretty much of his ſeed, which is common to many, who are not right good ſeeds-men; in the middle of each half of the land, which the ſeeds-man walks on, you may perceive a thicker liſt or ſeam than ordinary, when the corn comes up, as if it had been double ſowed, as indeed it has; and the other parts of the ground between muſt conſequently be thinner ſowed, by reaſon of this ſeed miſimployed: old ſeeds-men will often do this when the wriſt of their hand grows weak; but ſuch a ſeeds-man ought by no means to be ſuffered to ſow.

My ſeeds-man ſays, he has many a day ſowed five, and ſometimes ſix quarters of oats or barley per day; though it is a very hard day's work; but wheat, he ſays, is too heavy a grain to carry ſo much of, and that three quarters of wheat per day is very good ſowing.

Quantity of ſeeds, and why farmers differ in this in the hill-country.

§. 10. In our hill-country of Hampſhire ſome ſow two buſhels and an half of wheat on an acre, and ſome ſow four buſhels: I have been at a loſs to underſtand the reaſon of this diverſity. In both caſes, the ground being very poor, I do conclude, that where but two buſhels and an half are ſowed, the land lies cold, and is alſo cold in nature, (as at Eaſton) and muſt therefore be ſowed early, as in Auguſt, whereby it has the benefit both of the autumn, and of the ſpring-tillow. But in warm, tho' poor land, and lying on the open hills, yet much warmer than at Eaſton, ſhould they ſow early, it would run up to ſpindle; conſequently they are obliged to ſow late, perhaps the latter end of September, or the beginning of October;—whereby they loſe the benefit of the autumn-tillow, and can depend only on the ſpring-tillow, which on poor land is not conſiderable; therefore to fill out a crop they ſow it thick, viz. four buſhels on an acre.

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[k] Tritici quinque modios, hordei ſex modios, fabæ quintam partem amplius quam tritici, viciæ duodecim modios,—ciceris, & cicerculæ & piſi tres modios.—Plin. lib. 18. c. 24.

[l] Of this ſee Mr. Tull's and Mr. Duhamel's account in note on Granaries. Article—Of preſerving corn.

Of ſowing ill, or unſeaſonably.

§. 11. Whenever you ſee corn in flouriſhing proof, and of a good colour, tho' never ſo thin on the ground, you may be ſure the ground is in good heart, and would have born a great crop, had there not been ſome error in the managing it, either by under-ſowing, or by ſowing the ground out of order, in reſpect either to it's temper, or to the ſeaſon when it was done.

Quantity of ſeed on new broke up ground.

§. 12. Being at Mr. Whiſtler's, a diſcourſe aroſe about the quantity of ſeed to be ſown in a new broken up ground, rich in heart.--Mr. Whiſtler ſaid, he always underſtood that ſuch ground ſhould be ſowed thick.—And it is true; this is the practice: but the intent of this can only be, and the only foundation this practice is built on muſt be, that the thicker the corn comes up the leſſer the ear, and the ſhorter the ſtraw, and therefore not in ſuch danger of lodging as when ſown thin; for then the ſtraw runs to a length, with a long heavy ear; beſides, when corn tillows much, as in good ground ſowed thin it will do, many ſtalks or tillows on one root do not ſtand ſo firm as the ſame number of ſtalks do in the ſame field, where only one or two ſtalks ſtand on the ſame root.—But this method ſeems to ſtint the produce and power of nature, for fear of a worſe inconveniency attending the corn by being * more-looſe, and ſo apt to lodge;—whereas, in my opinion, this may be prevented by ſowing great wheat, or battel-door-barley, or beans, which have ſtronger ſtalks, and are not in ſuch danger of falling as vetches, peas, &c. are;—and thus the increaſe of the ear will not, as in the former caſe, be diminiſhed.

* looſe at root.

Of ſowing ſmall lean ſeed in poor ground.

§. 13. The only reaſon, as I conceive, for farmers chooſing the ſmalleſt and leaneſt ſeed for their poor ground, ſuch as ours in the hill-country, is, that the large ſeed has a poſſe in it to ſend forth more tillows than the poor ſeed, according to which power if the great ſeed ſhould exert itſelf, and the ground by reaſon of it's poverty could not maintain what it had brought forth in a green blade, then moſt of ſuch blades muſt die, or ſtarve; in which caſe, it had been much better to have ſown ſmall ſeed, which would have brought fewer tillows, and thoſe have been well maintained.—What way ſoever, whether by brining or liming your ſeed-corn, or nicking the ſeed-ſeaſon, it is of great conſequence, and the firſt good ſtep to be made, to get good roots from your ſeed; for, tho' your ground be poor, the larger and fairer the ſeed ſtrikes it's roots, it has the larger compaſs of ground to draw nouriſhment from.

Of ſowing under furrow.

§. 14. It ſeems dangerous to ſow any ſort of corn under furrow in gravelly land, or ſuch ſtony ground as may bind after rain, tho' it ſhould work never ſo fine; for the ground being inclined to bind makes the corn require a much longer time to come up, whereby it runs the greater danger of ſuch weather falling, before it can come up, as may deſtroy it.

Of ſowing ſpring-corn.

§. 15. In the ſpring-ſowing-time, in our hill-country, we may venture to plough and ſow our ground a little wetter in the beginning of the ſeed-ſeaſon than we may in the middle and latter end of it, becauſe at the beginning of the ſeaſon the air is cooler than at the latter end, and the ſun not ſo ſcorching; and ſo the ground ploughed and ſowed a little too wet will have leiſure to dry moderately, and not be ſo ſubject to bake and bind as towards the latter end of ſowing-time, when the ſeaſon begins to be ſcorching.

Of ſowing ſummer corn early on ground winter-fallowed dry.

§. 16. If ground, be it clay or other cold land, has been ploughed when dry in winter, and ſo early, that the rains and froſts it has ſuſtained have ſlatted it to powder; ſuch lands no one ſhould be afraid of ſowing to barley, oats, or peas, a fortnight ſooner than uſual, in caſe the ſeaſon be very dry, ſo that it will harrow on one earth in duſt, or ſtir up in like manner by the plough; for, if the earth be in ſuch temper, no froſts, even the very hardeſt, following immediately on ſuch ſowing, can freeze the ground, becauſe there is no watery ſubſtance in it to be frozen, and the ſeed, being put into the ground dry, cannot freeze, and ſo muſt lie in a warm dry bed.—But again, ſuppoſing rain ſhould immediately come, and hold for a fortnight after ſuch ſowing, yet ground ſo ploughed and ſowed, as aboveſaid, will lie very light and hollow, for the air, and winds, and ſun to dry it apace, and will not lie cold to the corn, as cold clays fallowed and ſowed heavy would do, ſo that your corn will then lie ſafe: again, when corn is ſowed in ſuch ground in duſt, a moderate rain will not throughly wet it, but the ground, when ſo dry, will take it without being glutted; and if ſuch rain ſhould continue for many days, time is gained, and the ſpring, by the end of thoſe days, will be much nearer advanced, which is a great point gained.—But ſuppoſing the worſt, that, after many days rain, when the ground is throughly wet, a ſmart froſt ſhould come; neither in this caſe would corn, ſown when the ground was in ſuch order, take harm; for firſt, it is to be conſidered, that towards March the ſun has got ſome ſtrength, and that froſty weather is uſually clear weather, when the ſun ſhines by day, and thaws as deep as the froſt went by night, which froſts at that time of the year ſeldom go ſo deep as the ſeed lies, in ground working in duſt when ſowed, which falls in deep; but ſuppoſing the froſt ſhould go as deep as the ſeed ſown, it muſt ſtill be allowed, the roots of the ſeeds ſtrike downwards, and firſt form themſelves before the ſpear peeps out of the rind, or ſhoots through the ſkin of the corn; ſo that to hurt the roots the froſt muſt go deeper than is common at that time of the year; but to prevent all poſſible evil from froſts by ſowing corn ſo early, when the ground invites you to it by ſo excellent a temper (which I do not eaſily foreſee can happen) the perſon ſo ſowing his corn may do well to roll it immediately after ſowing, whereby the ground ſo compreſſed, if rains ſhould fall, and then hard froſts happen, would be able, by being more compact and cloſe, much better to reſiſt the froſts.

Bad cuſtom among the farmers in their ſowing.

§. 17. It is the cuſtom of farmers too frequently both at autumn-ſeed-time for wheat, and at ſpring-ſeed-time for barley, to plough up ſeveral acres of each ſort a fortnight beforehand, in order to ſow and harrow them in immediately, whereby they think, who have a great deal to ſow, that they make a mighty diſpatch, having prepared ſo much land beforehand, and kept themſelves thereby beforehand in their buſineſs, and out of a hurry; but I take this method to be very improper and ill huſbandry, for I have always obſerved ſuch ſowings to be full of weeds.—The reaſon of which I conceive to be, becauſe in Auguſt, and at the beginning or in the middle of September, and in the middle of March, when theſe beforehand-ploughings are performed, the ſeaſon of the year is warm enough to ſet ſeeds on growing, and the earth moldering under the plough is well prepared for that end, whereby the ſeeds of weeds begin to chiſſum or ſet forth their roots, and to germinate in ſuch land ſo ploughed up before the corn is ſowed, the harrowing in of which when ſowed will not prejudice ſuch ſeeds ſo as to choak them; no wonder then if you have another crop of weeds along with the crop of the firſt ploughing, and by harrowing in the furrows freſh ſeeds of weeds are moved; —but if any ground may be ſo managed it ſeems that for peas may, becauſe in ſuch caſe, if one plough barley-erſh for peas beforehand, we plough it about the latter end of February, which is before the ſeaſon of the year is ſo far advanced, as to make the ſeeds of weeds put forth either root or branch, and therefore, in this caſe, I have known it often done ſucceſsfully.

Cold, looſe land to be ſowed early, for wheat or winter-vetches.

§. 18. Thoſe lands that before harveſt, on the ſun's withdrawing from us, give-out in nouriſhing and ſupporting the corn, as, amongſt others, cold, looſe, hollow, wood-ſear land will do, ſuch lands ought to be earlier ſown at autumn for wheat or vetches, becauſe in ſuch ground the corn will come but ſlowly on to eſtabliſh a root before winter, for the ſame reaſon that it gives-out the following autumn before harveſt; but ſuch ground ought not therefore to be ſowed early in the ſpring with tender grain, ſuch as white oats, barley, &c.—the ground being too cold; ſuch ground alſo ſprings later with graſs, and againſt winter grows ſooner rowety.

§. 19. There is no article in huſbandry of higher regard, and of greater conſequence than the rule of difference and diſtinction we ought to make between the ſeaſons of ſowing light, white, and chalky earth (of which we have abundance in our hill-country) which is generally very poor, and other ſorts of earth. By the conſtant experience of my neighbours huſbandry, and my own bought experience, I find, that, if ſuch chalky white ground be ſowed very wet, the whole crop is like to be very ordinary, tho' the ground was put into the beſt heart; for ſuch grounds ploughed wet, to the degree of fatneſs or dawbineſs, will certainly bind, and grow obſtinate to a greater degree than the ſtiffeſt clays ſo ploughed; ſo that little corn will be able to come through, nor ſhall the corn which grows be able to ſtrike roots freely, by reaſon of the ſtrong union of the white earth; and ſucceſſive rains, after you have ſowed white earth in ſuch condition, will ſooner looſen and open and mollify the parts of clay-earth, ſo as to let corn through than of white earth; therefore ploughing ſuch ground wet at ſeed-time (for fallowing it wet cannot be amiſs) or harrowing it wet and dawby is moſt pernicious: yet it is a common thing for the farmer, when the rainy ſeaſons make it too wet at ſeed-time to plough other grounds, to plough and ſow in the white lands, being deceived by the mellow breaking of ſuch earth, which ſeems to fall in pieces, all which ſoon cloſe into a ſolid compact ſubſtance; nay, the very beſt of the farmers, who are afraid of, or avoid the former evil, will in ſuch caſe run into another, when the white earth is too wet to plough and ſow at the ſame time, viz. they'll plough up ſuch lands, and take the opportunity of ſowing them when they are dry; but this is bad practice; for the inner parts of theſe lands bind and ſquat together below the harrow tinings, ſo that the corn cannot ſtrike roots, and if rainy weather continues two or three days after it is thus ploughed, the top of the earth will bind and ſquat alſo; ſo that the harrow tinings will never heal the corn, nor open the ground, tho' they go twenty times over it. The farmer will alſo, through diſpatch, in a hurry of much buſineſs, ſow his ground in this wet condition, which brings commonly an additional affliction; for, if wet weather follows, his corn muſt lie above ground, unharrowed, expoſed to the birds, and will ſoon grow, which will oblige him to harrow it in more wet, and unſeaſonably than otherwiſe he would; and theſe are the conſequences of ſowing ſpring-corn in white-land, either over or under furrow.

Of ſowing white earth that is graſſy.

§ 20. A crop of corn ſown on white earth, after it has lain down long to graſs, is hazardous, if there come a hot ſummer after it; a ſecond crop does better; your corn may then with drags and harrows be let in as deep as the plough goes, and, being rolled, will indure the heat and want of rain.

Rule for ſowing ſpring-corn.

§. 21. It is much in the power of farmers to make a ſhort harveſt every year, which would be much to their advantage. This might be effected by the order of ſowing the different ſorts of corn, viz. to ſow the rath-ripe and earlier corn ſo in order, that they might be ripe nearer together, and as early as poſſible. To do this it is but imploying the more hands in a ſhorter time, whereas there are too many farmers, who, for want of this contrivance, or out of a delight they have in imploying but a few hands, ſo ſow their ſeveral ſorts of corn, as to cut them with the feweſt hands in a lingering manner, not conſidering how much is loſt by the thinneſs of the corn in meaſure, in a backward harveſt, beſides the too frequent damage by rains in being late.

Of ſowing SUMMER or WINTER-CORN early on one Earth.

§. 22. The reaſon of ſowing ſummer or winter-corn earlier on one earth is, becauſe the ground being cloſer and firmer underneath than land often ſtirred, the corn cannot ſo eaſily enter with it's roots, and gain a depth before winter or ſummer advances.

Advantage of ſowing early.

§. 23. There is a great advantage in ſowing early, where it may be done, by ground being in it's nature warm, and lying warm, and being ſkreen'd from north and eaſterly winds. It is no ſmall inducement to it alſo, where it may be done with good huſbandry, in conſideration that the ſtraw of the corn will be ſo much the ſhorter, whereby it is evident the ſtrength of the ground will be ſo much the leſs exhauſted.

What land not to be ſowed early.

§. 24. Such land as was hard ploughed, and thereby ſubject to weeds, or was pot-dung'd, a farmer, of whoſe judgment I have a very good opinion, ſaid, he choſe to ſow about the middle of Michaelmas, becauſe the ſowing ſuch land of the firſt ſort early made it ſubject to weeds, and if pot-dung was laid early on ground it would be apt to breed weeds.——I aſk'd him how the early ſowing of land hard ploughed made it ſubject to weeds. He replied, that much ploughing brought weeds; I ſuppoſe cutting the roots into pieces that grow, as it is by colts-foot, which being ploughed in early get a-head before the winter comes, but being ploughed late is apt to be killed by the winter.

Of change of ſeed.

§. 25. [m] Though white and clay-land may bring corn of very good change for each other to ſow, yet in a cold country, where both thoſe ſorts of land are cold and conſequently bring a coarſe and thick rin'd-corn, I do by no means allow of ſuch ſeed for change, as before hinted. The change of earth to ſeed is not of that conſequence to a crop of corn, as is the flinging in of ſeed in perfection into a cold ground in a cold clime.

So much depends on the goodneſs of your ſeed, that Mr. Hillman of Berkſhire, a gentleman of great experience in huſbandry, ſaid to me, I verily believe a farmer, that ſows clean ſeed and good change, may live as well upon his farm as the land-lord could do, that had that only farm, and kept it in his own hands, but ſowed foul ſeed, and was careleſs in his change; for what ſignifies it to give one ſhilling in the buſhel extraordinary for fine ſeed-wheat, when three buſhels will ſow an acre, the produce of which may be ſuppoſed to yield twenty buſhels that will raiſe twelve pence per buſhel extraordinary; beſides, if foul ſeed be ſown, the burden cannot be ſo large; for a great deal of it will be taken up in weeds.

It is however to little purpoſe to ſow the cleaneſt of ſeed in the common-field-lands; for it will never come out fine again, becauſe the neighbours in ſowing caſt over ſome of their ſeed into each other's land.

Of wounds in ſeeds.

§. 26. Any wound to the nib of any ſeed, wherein the ſmalleſt fibre is damaged, grows up and increaſes with the plant, as a wound in the bark of a tree: any imperfections in the leaves of bean-ſtalks, when they firſt come up, or other ſeed leaves, ſeem to owe themſelves to this cauſe.

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[m] The common opinion, ſays Mr. Tull, is, that the ſtrong clay-land is beſt to be ſent to for ſeed-wheat, whatever ſort of land it be to be ſown on; a white clay is a good change for a red clay, and a red for a white; that from any ſtrong land is better than from a light land, and that ſand is an improper change for any. But from whatever land the ſeed be taken, if it was not changed the preceding year, it may poſſibly be infected with ſmut; and then there may be danger, tho' we have it immediately from never ſo proper a ſoil.

Defective beans come from defective ſeed.

† moldy.

§. 27. Towards the latter end of May (1707) I ſowed garden-beans in a piece of ſtrong clay-land in my garden; the ground being in heart, I expected a crop of beans in the beginning of Auguſt. The ſeed-beans were † finnowy, and ſomewhat damaged withinſide (for I broke many of them) being laid in a dampiſh place; the halm or ſtalk came up well, and they bloſſomed well enough, but not one kid came of all the bloſſoms, tho' I ſowed a ſpot of ground two or three lugg-ſquare: the chief end for which I inſtance this is it's relation to a preceding obſervation, that defective beans proceeded from defective ſeed.—And this is the more obſervable, becauſe in the bloſſoming-time frequent and great ſhowers of rain fell, and continued ſo to do till Auguſt, ſo that this failure could not be attributed to any blight, or want of moiſture, but to the defect of the ſeed only. —I alſo had this ſpring ſome ſummer-goar-vetches, that had been harveſted wet, and lain all the winter ſodden in their kids, and when threſhed they were finnowy and ſtunk; I doubted whether or not they would grow; I made a trial of them in the garden, but not half of 'em came up; ſo I ſowed about two acres of 'em in a treble quantity, but having ten acres to ſow I bought ſeed for the other eight acres, and I obſerved, tho' I know the whole ten acres were of equal goodneſs, that the vetches of the damaged ſeed did not produce one tenth part of the kids the ſound ſeed did, tho' the halm of each was much of the ſame goodneſs.

Mr. Bobart, of the phyſick-garden at Oxford, gave me ſome Smyrna cowcumber-ſeeds, of which very few came up, but none of thoſe came up which he reſerved for himſelf: the reaſon was, as Mr. Bobart ſuſpected, becauſe he kept his too long in the mucilage, after he had taken thoſe out which he gave to me; and I do ſuſpect that mine alſo, though not kept ſo long in the mucilage as to periſh wholly, had however in the ſeed of the ſeed received a periſh; becauſe, tho' the fruit came up very fair, being twelve inches long, yet every ſeed of ſome hundreds of them wanted a kernel. The like defects I have already obſerved in beans, whoſe ſeed hath been defective, and bore no kids, tho' they bloſſomed, and others I have had bearing kids and yet not ſeeds; all which, as well as that of the cowcumber, proceeded from the defects of thoſe parts of the plant, which had been formed perfect and compleat in the ſeed, but had, while in that ſtate, received ſome damage, ſo as to occaſion a putrefaction in them, more or leſs, according as they were more or leſs tender; for, as the plant by glaſſes is to be ſeen perfect in the ſeed, ſo the reſpective parts of flower, pods, and ſeed of the pods, tho' ſmaller than a mote in the ſun, may for as much reaſon be conceived to be fully formed in the ſeed: it is plain the kernel of the ſeed is not ſo tough or firm a body, as the plant itſelf, or as the pod, or the ſkin of the ſeed, the kernel being at firſt but a thin gelly or mucilage, and therefore more liable to be damaged. It may be refer'd to the above obſervation of the Smyrna cowcumbers, that, of thoſe exotic plants, which come from warmer climes than ours, though they are of a ſtrong nature, and grow well with us, yet many will not bloſſom with us, and ſome, that will bloſſom, will not ſeed; becauſe, as the bloſſom is more tender in the ſeed than the plant, ſo is the ſeed of the ſeed more tender than the bloſſom. Lucerne graſs rarely ſeeds with us, tho' it flowers, but the jeſſamine never; and it is very probable there are ſuch defects in mulberry, grape, and fig-ſeeds here in England, that from the ſeeds of the fruit growing in England they can never be propagated in England, though from their ſeeds they may be propagated in other countries: this alſo may ſeem to account for the degeneracy of the foreign coliflower-ſeed, when ſown in England, from whence, in two or three years time, if ſown from ſeed raiſed here, no flower will proceed, but only a cabbage-head. Thus apple and pear-trees have been known not to produce kernels, which I ſuppoſe was from the damaged ſeed; and I do therefore believe the cyons or cuts of ſuch trees will not produce kernels; of oranges, &c. likewiſe it is ſuppoſed the firſt failure is in the ſeed: Mr. Bobart ſays, oranges rarely ſeed in England.—Heat and drought, as well as cold, will, I doubt not, hurt the ſeminal juices of a plant before any other part; for in the very hot and dry ſummer, in the year 1705, I found few apples that had any kernels in their ſeeds, tho' the cotylidones ſeemed perfect enough, and I queſtion whether under the tropics, or near them, the apples bear ſeeds, or the huſks of the ſeeds kernels. Seeing therefore that fruit is never the leſs perfect, tho' it has no ſeeds, quære whether the ſtamina farinacea in the flower does not contribute to the well-being of the fruit as well as the ſeed; (God having intended the fruit for the uſe of mankind, as well as the ſeed for propagation) otherwiſe the bloſſom that proves ſeedleſs ought to fall, as it is obſerved to do when the ſtamina farinacea are wanting; for then the whole deſign of nature is defeated, both in reference to fruit and ſeed.

§. 28. The farmers of Crux-Eaſton, and this hill-country, buy their ſeed-wheat from Newbury and that country, becauſe there they are on a white earth, whereas Crux-Eaſton is on a red earth; and the country about Newbury buy their ſeed-wheat of us, becauſe to change is thought beſt.—The changing the ſeed of all grain whatſoever is of as much uſe and ſervice as half the dung ſufficient for a crop; therefore the farmers are often to blame for not changing ſo frequently as they ought to do; if their corn prove good and fit for ſeed they will ſow it a ſecond year, and ſo it may do tolerably well, but longer it will do very ill.

Change of ſeed.

I have a great opinion of the advantage of changing ſeed every year rather than once in two years; for I ſowed barley of the laſt year's ſeed in the beginning of April, and I ſowed part of the ſame ground, but a clayier piece of land, with freſh ſeed of this year's change on the laſt day of April, which ought to have been the coarſer barley, whereas it proved full as white and fine, if not finer than the other.

The order in which different crops ſhould ſucceed one another.

§. 29. [n] Pliny takes notice, that the rule laid down by Virgil is, to let the land lie fallow every other year, which, if the farm be of ſufficient ſize to admit it, he thinks is a very good way, but if you are ſtraiten'd in conveniency of this kind, he adviſes to ſow wheat after lupines, vetches, or beans, or any other grain that has the quality of fertilizing and enriching the ground.—This is to be well noted, becauſe in England, where our land is worſe, the farmer if he pays twelve ſhillings an acre, will not imagine rent can be paid, unleſs he ſows it every year, and he will not lay it down to graſs.

Of ſowing peas after wheat.

§. 30. Some farmers approve very much of ſowing peaſe after wheat, and then barley, and ſay, it will make a better tilth for the barley, and be the lighter, inaſmuch as the ground lies down a year with wheat, and but half a year with peaſe, therefore better to ſow barley after peas than after wheat; but it ſeems to me the beſt way is (inaſmuch as it may ſuit other circumſtances of conveniency) to ſow the clay-land to peas, and then to barley, becauſe the clay-land will be the better mellowed thereby for barley; and the whiter and mixt land to wheat, and then to barley, becauſe the whole year ſuch land goes with wheat will not prevent it's working unkindly for barley.

Peas do beſt on barley-erſh.

§. 31. The country people ſay, peas do beſt on a barley-erſh, and of this I have ſpoken more at large under the article Peas, to which I refer the reader.

To ſow wheat after peas on clay-land.

§. 32. Farmer Wingford falling into my company, I told him I purpoſed to ſow my clay-land to peas, and then to barley, and lighter land to wheat and then to barley: he reply'd, I might alſo very well in my clay-land ſow wheat after peas, which I remark, becauſe I think it properly ſaid; for peas will be a manure to wheat on ſuch land, and not make it ſo light as to be ſubject to blight, and clayey heavy lands in Wilts are ſo managed.

I aſk'd farmer Elton, why I ſhould not on the ſtrong clay-land of Crux-Eaſton ſow wheat after peas, ſeeing ſtrong clay-land could not by being lightened by the peas-ſtubble be ſubject to blight, and it was the method of many countries, where their land is of a ſtrong heavy clay, to ſow wheat on peas or vetch-ſtubble; he replied, they had on the clay-peas-ſtubble ſowed wheat the ſame year at Crux-Eaſton, and it had ſometimes come well, but for the moſt part ill; for the worm had in October, November, and December fallen on it, and eat it up. I put afterwards the ſame caſe to farmer Biggs, and he ſaid, if the ſeaſon proved dry for ſowing wheat after peas, the wheat generally proved well on clay-land; but, ſaid he, if the peas-ſtubble be wet when ploughed, the land being hollowed by the peas-ſtubble will lie very cold, hollow, and wet the whole year after, and the wheat, if a bad winter, die away. I replied, when I ſpoke of ſowing wheat after peas, I did not mean the ſowing it till the year after. He ſaid, he thought there could be no better huſbandry than that, and free from the before-mentioned inconveniencies.

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[n] Virgilius alternis ceſſare arva ſuadet, et hoc, ſi patiantur ruris ſpatia, utiliſſimum proculdubio eſt; quod ſi neget conditio, far ſerendum, unde et lupinum, aut vicia, aut faba ſublata ſint, et quæ terram faciant lætiorem. Plin. lib. 18. ſect. 10.

I obſerve, in Wiltſhire, where the ſaid huſbandry is uſed of ſowing wheat on the ſame year's peas-ſtubble, that the ground is of a heavy malmiſh ſort of clay, and conſequently not ſubject to the inconveniency of our dry hill-country ſtrong clay, which is apt to be hollowed too much after peas-ſtubble; again, ſuch huſbandry is practiſed often in common-fields, where people will not be at chargeable huſbandry; it is alſo practiſed (inſtead of manure) where lands lie at a diſtance from a farm-houſe, and in deep baning lands, where the huſbandman dares not truſt to his fold.

If one would ſow a large quantity of wheat on a peas-erſh, it muſt, in the hill-country, be with a proviſo that harveſt does not fall out very late; for in that caſe a large quantity of ground cannot be ſowed on a peas-erſh early enough, but a conſiderable part of it, eſpecially the poorer ſort, will be obliged to be ſown to barley.

Oats may ſucceed wheat better than barley can in wet years.

§. 33. It had been a mighty wet winter and ſpring, whereby the fallows were well wetted: I had that year a great crop of oats, and but a midling crop of barley, which I impute to the barley's lying wetter, by being buried deeper in the cold earth; whereas the ſurface of the earth, in which the oats were ſowed, was ſoon and eaſily rectified, the ſun having full power to penetrate that; and to move the ſalts, &c. for which reaſon, in ſuch wet years, the huſbandman ſhould alter his meaſures, and ſow his barley-fallows on one earth to oats.

Sowing wheat too ſoon after French graſs, condemned.

§. 34. Mr. Byſſy of —— near Bradford in Wiltſhire, ploughed up a piece of French graſs ground worn out, and ſowed it on one earth, and ſaid he had excellent barley; and the next year he ploughed it for wheat, which whilſt he was doing, farmer Sartain came by, and ſaid, that ground would fool him, for he would have no wheat;—and I having obſerved a wheat-ſtubble of his to be very indifferent, aſked him, how it came to paſs his crop was ſo ordinary; he ſaid, that was the ground abovementioned, and added, that the corn all blighted; he thought the roots of the French graſs, being not ſufficiently rotted, or rather too rotten, but yet not converted into mold, made the wheat * more-looſe, which I believe reaſonable, and therefore ſuch ground is to be well conſidered of before ſo huſbanded.

* looſe at root.

What ſucceſſion of grain on new broken up rich ground.

§. 35. Mr. Raymond of Puck-ſhipton in Wilts, broke up ground of 30 s. per acre to deſtroy the ant-hills, and the firſt crop he ſowed was white oats; for, ſaid he, if it be ſowed with wheat it will be mad, and come to nothing; the ſecond crop he ſowed was ſome ſort of great wheat, whoſe ſtraw is ſo large and ſtrong, that it is not ſubject to lodge; whereas, ſaid he, if ſown with any of the ſmaller wheats, ſuch as red ſtraw, &c. the ſtraw of thoſe are weak, and would certainly, being rank, fall down and lodge; the next crop, ſaid he, I will ſow red ſtraw; for by that time the ground will be tamed; and this is the approved method in that country, where rich lands are broken up.

§. 36. The

Order of ſowing in the Iſle of Wight, Hertfordſhire, &c.

§. 36. The whole method of huſbandry in the Iſle of Wight is, upon the firſt tilth of land to ſow peas; on the next wheat, and then barley. In Hertfordſhire the method is to ſow, firſt wheat, next peas, and then lay down to fallow for a wheaten crop, or elſe ſow oats after the wheat, and lay down to graſs-ſeeds.

In Eſſex, &c.

In Eſſex, and ſome other places, eſpecially where the ground has been improved by chalking, they firſt ſow wheat, then beans, which, being kept clean by the hoe, they reckon equal to a ſummer-fallowing, then wheat again, ſowing broad clover on their laſt wheaten crop.

In Wilts.

About Holt, it is a great practice to ſow wheat after peas, and then peas, and wheat again, not having in thoſe parts ſo much land as to afford to let a ground lie ſtill for a ſummer-fallow. They reckon that a peas-crop does the wheat as much kindneſs as laying it to a ſummer-fallow.

In Leiceſterſhire.

In Leiceſterſhire they ſow a wheaten crop the laſt, and lay down to graſs; the reaſon they give is, becauſe, the ground having a twelve-month to grow to graſs, the year following they may expect a very good head of graſs; and ſo gain a year by it; whereas, if they ſow it with a ſummer-crop, they can expect but little ſhow the firſt year; and Mr. Clark ſaid further, that they counted the wheaten ſtubble kept the graſs warm in winter, and, as it rotted, the worms drew it into the ground, which made much for the graſs [p].

Wheat ſown on poor land will not yield well.

§. 37. I am fully ſatisfied on experience that whoever keeps land poor, and ſows it with wheat, which grain requires land, (according to it's nature) in good heart, it will not only produce a thin crop in ſhow, but alſo a crop that will fall ſhort in reſpect of yielding.

Not to be ſown on the green-ſtubble of goar-vetches.

§. 38. Whatever the practice may be to the contrary, I hold it improper to ſow wheat on the green ſtubble of goar-vetches cut for horſes: this ſtubble being ploughed in with the wheat will finnow, and heat, and moldy the ground, and be ſo far from feeding the wheat with a ſweet diſh that it will make it produce but ſmall ears, and weak tillows, and thin bodied corn.

Wheat near oats brings foul ſeed.

§. 39. No wheat can be enſured to be clean ſeed from oats, if oats be ſown in the next adjoining ground, for the rooks and ſmall birds will carry them into the wheat-land.

Of ſowing wheat after wheat.

§. 40. I have ventured to ſow ſome grounds with wheat after a wheaten crop the time before, being ſummer-fallowed the year after for the ſecond crop, and have found by experience that ſtrong land will bear an excellent crop of wheat after wheat, provided it be ſummer-fallowed the ſecond year, that is, let the ground reſt one year, dunging, or folding it for the ſecond crop; but by experience I find, that ſhallow light ground will produce but thin wheat, and a ſmall ear, if ſowed to wheat after wheat, and a ſummer-fallow taken between; though the ground be dunged for ſuch ſecond crop, eſpecially if the ſpring prove cold and wet; for ſhallow or weak ground being unkind for a crop of wheat ſo managed, if the ſpring and ſummer prove unfavourable favorable to this grain, ſuch ground will ſhew it's paſſiveneſs, and tokens of ſuch inclemency, much more than ground of but equal ſtrength, when ſowed to the firſt crop of wheat.

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[p] See the author's obſervations on Corn in general, where you will find ſome particulars relating to ſowing.

Of SOWING WHEAT.

Of ſteeping corn. See Wheat, §. 14.

§. 41. [q] Lord Bacon, in his natural hiſtory, ſays, he ſowed wheat ſteeped in urine and dungs of ſeveral ſorts, chalk, &c.—And that the corn ſteeped in urine, and ſowed in the ſame earth with the reſt, came up, and grew bolder than the reſt;—Therefore it ſeems of conſequence that ſheep and other cattle have plenty of water;—But he ſays not that he let it grow till it came to ſeed.

Of ſowing wheat under furrow.

§. 42. I had wheat ſowed under furrow in a ground which I had ploughed, thwarted, and dragged, after which I ploughed and ſowed the corn in the moſt huſbandlike manner I could; and indeed the wheat came up in the furrows in uninterrupted parallel lines, and without any weeds between the furrows.—But farmer Ginneway ſaid, that the ground at ſeed-time working ſo curious fine ſhould have been ſown one caſt over the other under furrow, and then the ground between the furrows had been filled, which I believe to be a good way.

By the conſideration of a ground where I have wheat ſown this year 1706, where the ground had been winter-fallow'd, and brought to a curious mold, I am apt to believe, that in our cold clime, wheat in ſuch earth ſhould be ſown under furrow, that it may lie the deeper; for this crop on the 24th of April was miſerably thin, and what blades grew ſeemed ſomething towards an ink-blue, and the roots ſeemed matted on the ſurface of the ground; which makes me believe, that the winter-corn was not buried deep enough; being ſown, as this ground was, not till the 25th of September, it lay too much expoſed to cold; for, where ground works fine, the earth crumbles in at the firſt tining, and fills up the furrow; and three or four tinings finiſhes it, in which caſe it is not poſſible it ſhould be well buried.—If ground works well, it is alſo beſt to ſow vetches under furrow, the dung in that caſe being laid on the ground after the thwarting it. At ſowing, the ground working ſo fine, the ſeed was not eaſily buried, but lay on the ſurface, which was inconvenient.

Some conſideration there ought to be whether you ſow under furrow at two earths or three. It ſeems, if no reaſon offers to the contrary, that wheat folded on fallows ſhould be ſown under furrow on the ſecond earth, becauſe the ſtrength of the dung is turned down to the corn, but, if folded on the ſecond earth, then, for the ſame reaſon, to be ſown under furrow on the third earth; but if the winter-fold for barley was on lay-ground, the barley ſhould, for the ſame reaſon, be ſowed under furrow on the third earth.

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[q] In contradiction to this, Mr. Tull aſſerts, that, if ſeed-wheat be ſoaked in urine, it will not grow, or, if only ſprinkled with it, it will moſt of it die.—A very knowing huſbandman, whom I conſulted on this occaſion, confirmed the former part of Mr. Tull's aſſertion, and aſſured me he had found it ſo by experience, but added, if the urine were mixed with ſomewhat more than one half water, it would make excellent brine for ſeed-wheat.---See more on this ſubject in the author's obſervations on Wheat.

September 14th, 1699, I obſerved a cloſe ploughing up in Leiceſterſhire, and the corn ſowing under furrow; the ground had been limed, and ſo ſtrangely run to weeds that I wondered at the boldneſs of the huſbandman, and went up to him.—He was ſowing his wheat ſteeped in lime; I obſerved the grain was plim and very large; I told him in Hampſhire we eſteemed the leſſer wheat the beſt; he ſaid, in the common-fields, where they gave three earths, which laid the land light, they uſually ſowed of the ſmaller ſeed, but (ſaid he) here we chooſe a large ſeed, as ſuppoſing it has ſtrength to ſhoot forth it's ſtalks through the clots and earth it lies under; for it now lies deeper, and the earth cloſer and heavier upon it than if it were ſowed after the plough, and harrowed in; beſides, if very wet weather ſhould fall upon it, ſo as thoroughly to wet the trumpery of weeds we turn in, a ſmall grain would be ſooner chilled than this large ſort.—I aſked him, how many buſhels he ſowed; he ſaid, three to an acre.

Mr. Biſſy of Wiltſhire being at Eaſton I told him of my new huſbandry of ſowing my wheat under furrow, and ridging it up.—He ſaid, if I ſowed it under furrow ſo, I muſt take care to be ſure that the ground was ſo thoroughly moiſt that the corn might grow from ſuch moiſture, though no rain ſhould come; for he had known crops often loſt, by ſowing dry under furrow,—and I remember my carter had told me the ſame thing.

In North Wiltſhire, when they ſow under furrow, I find by the account of many experienced huſbandmen, that they aim to ſow the laſt of their crop that way, and to ſow it on mellow earth, ſuch as peas-erſh: the reaſon why they generally ſow the laſt of the wheat ſo, is, becauſe it is the latter end of autumn, for the moſt part, before the ground is well wetted, and in order for it; for it is the greateſt caution they have not to ſow dry under furrow, but, on the contrary, to ſow ſo wet that they may be ſure the corn will grow: but I find they all agree, provided the earth be wet enough, the middle of Auguſt would not be too ſoon to ſow under furrow.

Time of ſowing wheat.

§. 43. It ſeems to me in early harveſts, occaſioned by hot and dry ſummers, at which times the wheat is alſo very yellow, and ripens to perfection, there is no need to ſow ſo early as in cold wet ſummers, when the harveſt is backward, and conſequently the wheat more horny; for the ground being heated, or in a manner burn-beaked by the hot and dry ſummer, and the flour of the wheat dry and mellow, it will come up and ſhoot away at an incredible rate, and the after-maſſes of all graſſes in the autumns of ſuch ſummers carry a ſtrong deep green, a token of the ground being impregnated with the heat, and a proof likewiſe that it has not been exhauſted of it's ſpirits, for they were not tranſmitted into vegetables, being bound up for want of a vehicle to infuſe themſelves into their roots by rains; but after cold raw ſummers the autumn-aftermaſs of graſs has a weak pale verdure.

§. 44. It was May 12th (anno 1700) and time to conſider what to do with the wheaten fallows. Several good farmers were of opinion that it was time enough to ſow my fallows a fortnight before Michaelmas, becauſe I had dunged them; but, ſaid they, in caſe one ſows a light and poor ground, or a cold ground, without well maintaining it, ſuch ground ought to be ſowed the beginning or middle of Auguſt.

To ſow wheat wet.

§. 45. [q] To ſow ſummer-corn dry, and wheat wet, is accounted beſt for different reaſons, viz. in the ſpring there is no doubt but rain will come enough to bring up the corn, and in September, when wheat is ſown, there is little danger at that time of the year of ſo much ſun as to harden a cruſt on the earth, ſo that the corn cannot get out, tho' ploughed and ſowed wet.—It may not be amiſs however, if one ſows wheat at the latter end of the year, ſuppoſe at Michaelmas, to ſow it when the ground is dry; for that time of the year grows cool, and large dews fall, nor can it be long before rain will come; and, if it be cold land, and ſowed at the latter end of the year, when the ground is very wet, it will be the apter to chill.

Time of ſowing wheat on various ſoils.

§. 46. In the beginning of Auguſt, 1697, I aſked a huſbandman when the farmer intended to ſow a certain field to wheat; he ſaid, in the latter end of Auguſt. I aſked him how that came to paſs, ſeeing he was already ſowing the field adjoining with wheat. He replied, it was becauſe that was ſuch light ground, that it muſt be ſown early, that it might get root before winter came on; otherwiſe it would be in danger of being killed; but, ſaid he, the former is a clayey heavy ground, into which the winter could not ſoon penetrate, ſo as to kill the corn; beſides, if that were not ſown late, the weeds would get ahead.

Practice in the Iſle of Wight.

On the other hand, December 19th (anno 1700) I ſaw ground of farmer Farthing's in the Iſle of Wight ſown to wheat, which was malmed, and it was not come up; alſo I obſerved ſome other perſons ſowing then; I thought it very late, and aſked the farmer about it. He ſaid, that, in their country (the winter being milder than with us at Crux-Eaſton) if ſandy and pooriſh land be ſowed early, it will have ſpent it's ſtrength on the halm, or green wheat, before the ſpring and ſummer comes, and will not then be able to maintain the crop.

The ſowing of wheat in the Iſle of Wight late, that is, at the latter end of October, and all November, eſpecially if land be poor, is very good huſbandry, (but it ſeems it ought to be well trod, leſt it ſhould blight by being too looſe) becauſe that country is warm through the vapours of the ſea, and it would ſpend itſelf too faſt, in caſe it was ſowed in September; but it is quite otherwiſe in many parts of Hampſhire, becauſe the cold lies ſo hard there, that the wheat cannot be too rank before winter, and will ſettle the better; yet, in caſe the winter ſhould prove ſo mild, that it ſhould by being ſowed early run to be rank, it ought to be refreſhed in the ſpring by pigeon's dung, or ſome ſuch contrivance; otherwiſe a ſmall and weak ear with a weak ſpindle muſt be expected.

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[q] It is a general rule, ſays Mr. Tull, that all ſorts of grain and ſeeds proſper beſt, ſown when the ground is ſo dry, as to be broken into the moſt parts by the plough. The reaſon why wheat is an exception to that rule is, becauſe it muſt endure the rigours of the winter, which it is the better able to do, by the earth's being preſſed or trodden harder or cloſer to it, as it is when moved wet. For this reaſon the farmers drive their ſheep over very light land, as ſoon as it is ſown with wheat, to tread the ſurface of it hard, and then the cold of the winter cannot ſo eaſily penetrate, to kill the roots of the tender plants.

Early-ſown wheat does not tillow ſo much in the ſpring as late ſown.

§. 47. The Hampſhire farmers obſerve, it is not to be expected, that wheat ſown ſo early as the beginning of Auguſt ſhould tillow ſo much, when ſpring comes, as wheat would do that is later ſown; becauſe wheat early ſown has already tillowed and too far ſpent itſelf in the forehand of the year.

Of wheat's tillowing.

I ſtruck in with a notable farmer in company with Mr. Hillman; it was July 24th, anno 1701; I aſk'd them, whether ſome in their country were not ſowing wheat; they ſaid, many talk'd of beginning; but, ſaid the farmer, I think they had better let it alone; for our's is a light and ſandy ground, and the ſummer has been very dry and hot, (for not above a ſhower or two of rain had fallen between May and that time) therefore, ſaid he, theſe laſt two days rain (for it had rained plentifully for two days) the corn by virtue of the great heat of the ground will riſe up very quick and faſt, and run itſelf out of heart before winter, and dwindle all next ſummer, for it is in a manner carrying a double crop;—ſo ſaid Mr. Hillman alſo.

Many of the hill-country of Hampſhire are of opinion, that a fortnight before Michaelmas and a fortnight after are the prime times for ſowing wheat in the hill-country,—but I do think all wheat ſhould be in the ground by Michaelmas-day.—It is true, too many of the hill-country do not huſband ſo well as they ought to do; for poor land ſown early, if a mild winter ſhould come, may ſpend itſelf ſo much, that at harveſt the ſpindle may be but weak; but if the land were better huſbanded, it would bear the running to rankneſs in the forehand of the year, tho' the winter ſhould prove mild, and have ſtrength enough not to abate of it's crop in the ſpring.

It was the 15th of September (anno 1702) when farmer Hawkins told me, that no wheat had then been ſown with them about Andover; for, ſaid he, our ground puts very forward in the ſpring, and wheat ſowed early would then be too proud.

In the hill-country.

It ſeems, that in the hill-country of Hampſhire we ought to take care not to ſow ſtrong clay-land too late with wheat; indeed, the beginning of September ſeems not to be too early, for there is no danger of clay-land, lying ſo cold, being too proud; the dews and cold nights in September and October, the froſts and cold rains in winter, and the cold ſpring will keep it back; ſo that it ſeems in cold clay-land wheat ought to get ſome good root before the cold ſeaſons come on, that it may be in heart to bear up againſt the winter; whereas earth of a mixture between white earth and clay being of a drier, warmer, and healthier nature, and in every of the foregoing reſpects capable of thriving both in October, and all winter long, how wet ſoever, as well as in a cold ſpring, if ſuch land be in good heart, it need not be ſowed till the laſt of all your land.—The mere white earth-chalk might alſo be ſowed as late, but that it is rarely in heart enough.

I was obſerving to ſome farmers of Holt in Wilts, it being in the month of March (anno 1702) that their wheat look'd much greener than our Hampſhire wheat at this time of the year. They ſaid, it was becauſe it was ſowed ſo much later, and that their's would loſe it's beauty, and it's firſt leaf would die and look ruſty were they to ſow early. In Wilts.

Mr. Clerk of Leiceſterſhire ſays, if the ſeaſon be mild, they often ſow wheat at Chriſtmaſs, and that Mr. Cheſtlin has ſowed wheat this year (1699) which is not out of the ground, it being the 12th of February; that if they ſhould ſow wheat as early as we do in Hampſhire it would be deſtroyed by weeds, as well as be too rank. In Leiceſterſhire.

Mr. Raymond of Puck-ſhipton, Wilts, tells me, the notable men, who make their obſervations in the vale, ſay, though they ſhould not have a ſeaſon to ſow their wheat ſo early as they would, by reaſon of the wet, and are forced to ſow late, ſuppoſe the middle or latter end of November, yet they find ſuch wheat will do very well, if very hard froſts do not come before it has made a pretty good ſpear under-ground; no matter whether it has firſt put forth a blade or not, for by the time the ſpear is ſhot under-ground the corn is well rooted. Wilts.

I have eight or nine acres of braſhy ground, tho' rediſh and clayey, occaſioned chiefly by the abundance of ſtones, which mixing with the clay make it hollow; this ground was fallowed up pretty late in the ſummer, viz. the latter end of July or beginning of Auguſt, with intention of ploughing it again, and ſowing it with wheat; but viewing it Septemher the 30th, after a good ſhower of rain, I found it would work and tear very well on one earth, ſo as to harrow off at ſix tinings at moſt; ſo, tho' the ground was deſigned for two earths, yet I ſowed it on one earth; for it is of that conſequence to get in corn in good ſeaſon, if the ground will work well, that in the hill-country, where we have a great crop of wheat to ſow, no opportunity of ſowing may be loſt after this time of the year; for it very rarely happens but wheat early ſown in ſuch ground as above deſcribed, and in the hill-country, comes off better, and produces a better crop than the laſt ſown wheat, tho' we were ſure of a ſeaſon for ſowing it.

I obſerved, that a few lands of the abovementioned ground had a pretty deal of graſs come up in them, and ſaid to the man, who was there ſowing, that I thought ſuch graſs would tear up pretty well with the harrows, the ground being hollow, and having lain down but one year.—He ſaid, that he thought alſo the graſs would do no harm, becauſe the ground would be ſown early, and ſo the wheat would out-grow the graſs, and top upon it,—which I thought a good reaſon. In ground run to graſs.

§. 48. [a] The old cuſtom in the hill-country in Hampſhire has been to ſow two buſhels and an half of wheat on an acre in the ground early ſown, but in that later ſown three buſhels and an half on an acre.—The reaſon they aſſign The earlier wheat is ſowed the leſs ſeed is required.

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[a] Mr. Tull obſerves, when wheat is planted early, leſs ſeed is required than when late; becauſe leſs of it will die in the winter than of that planted late, and it has more time to tillow.

aſſign is, that the earlier the wheat is ſown the more it will ſhoot out in blades and tillows, and ſpread farther, whereas the later ſown corn will not ſpread, the cold winter coming on it, and very likely give but one blade only.

One Parker came to ſee me with farmer Biggs; he was ſpeaking of the great fatneſs of their land for wheat, and ſaid, that at the latter end of November they ſowed but one buſhel on an acre, and, if in January, but a peck more; therefore, ſaid he, tho' we give fourteen ſhillings per acre, we ſow a buſhel leſs on an acre, nay a buſhel and three pecks leſs than you when we ſow late, for then, ſaid he, you commonly ſow three buſhels; ſo that the buſhel of ſeed you exceed in, or a buſhel and three pecks, will abundantly recompence for what we exceed in rent, eſpecially when wheat is at ſix ſhillings per buſhel; but then, ſaid he, we give three earths.

I was telling Mr. Bachelour of Aſhmonſworth, that I found I had underſeeded my wheaten crop that I had ſowed in my clay-lands in September and October this year (1705), and yet I ſowed three buſhels on an acre.---- To which he replied, that of late years he and others had by experience found, that at that time of the year it was beſt to ſow at leaſt three buſhels and an half; nay, ſaid he, the ground at that time will take four buſhels, and we find 'tis beſt to ſow four buſhels and an half of barley, and five of oats on an acre.

As moſt farmers, who ſow any quantity of wheat, propoſe to buy every year a load at leaſt of ſeed-wheat for change, ſo it is adviſeable to ſow the ſaid load of bought ſeed ſo early, and in ſuch forward ground, that they may be likely to houſe and threſh it time enough for ſowing the next year's crop, which, in the hill-country, is by the middle of Auguſt.

One ought to contrive to have the clean ſeed-wheat for a change as early as may be, becauſe it is much dearer than common wheat, and the earlier it is ſown it will go the farther, becauſe leſs need be ſown on an acre: again, it is proper to contrive to ſow the choice clean wheat in good land, becauſe the increaſe will be the greater, whereby you may have the more to ſerve your own occaſions, or to pleaſure your neighbour.

Of hand-picking ſeed-wheat.

§. 49. It ſeems to me cheaper and better to buy middling clean wheat for ſeed, and hand-pick it, than to buy clean ſeed, becauſe it coſts leſs to hand-pick that wheat than what one muſt give over and above for clean ſeed, which is never that I know of clean, though pretended ſo to be.

Sowing early prevents blighting.

§. 50. It is a common expreſſion in countrymen's mouths, that old wheat is not ſo ſubject to blight as new,---but, as I take it, the blight is not founded either on the newneſs or oldneſs of the corn, but inaſmuch as old wheat is generally ſowed betimes, and before new wheat can be had, therefore ſuch land is leſs ſubject to blight is true.

Again I judge, that, whereas it is ſaid, that wheat ſowed early is leſs apt to blight, the ground having more time to ſettle, the main reaſon is, not that the time that latter ſown ground hath to ſettle is not long enough before the burning weather and blights come; but that, when ground is ſowed early, it has time to ſettle before the froſts come, which keep heaving and hollowing it, and hinder it all the year after from ſettling.

§. 51. It is obſerved, that new wheat and old wheat being ſowed at the ſame time, the new wheat will at the end of the firſt three months be above a week forwarder than the old: for this reaſon I adviſe to ſow old wheat at the firſt and earlieſt ſowing, if you fear winter-pride, but new wheat, if you ſow late, and fear it will be backward in tillowing [t].

Different times of ſowing new and old wheat.

§. 52. In a hot ſummer, when harveſt comes early, before the ſtrength of the ſummer be far ſpent, when the wheat is yellow, tho' not hardened and thoroughly ripe, it is incredible how ſoon, if the ground be wet, * britted corn will grow. I had ſome acres this ſummer (1714) blown out by a high wind, enough to feed the ground for a baſtard-crop; and what fell in criveſſes and chinks, the wind coming with rain, grew to be five or ſix inches long in ten days time; ſo that in ſuch caſes, if you think to drag or plough it in, the ſooner the better; and, if you plough it in, the ſhallower the better, and the furrows as narrow as may be; that, if it cannot get through the furrow, it may have the leſs way to ſhoot ſlantwiſe before it meets a ſeam to come out at.----The leſs graſſy any ground is, and the more knot-fine, ſo much the narrower will the furrow turn up, or break by the plough.

Of ploughing in britted wheat for a baſtard-crop.

* brit ſhed.

Of SOWING BARLEY.

§. 53. [u] Sow barley in the drier lands, ſays Varro; ſo that, in thoſe hot countries, they did not look on their land too hot for barley.

§. 54. It was Chriſtmaſs (anno 1702) and farmer Biggs, farmer Crap, Mr. Bachelour, and farmer Haſcall were with me: I propoſed to them the advantage of ſowing barley and ſummer-corn earlier than they did by a week or a fortnight, in caſe the land was in any good heart, and in duſt, for the damage by what might die by bad weather would not come to ſo much as was always loſt by drought.----Farmer Biggs and farmer Crap were of my opinion, but Mr. Bachelour differed from us, which ſeemed to ariſe from his ſowing poor land early, but I grounded the ſuppoſition on the land being in good heart; however we all agreed, that the earlier barley was ſowed the finer it was, and the later the coarſer, which muſt ariſe from the firſt having it's growth from it's earing in a hotter time, whereas that ſowed later has much the colder time; ſo rath-ripe barley is generally the fineſt. Farmer Biggs ſaid at another time, that a week's ſowing earlier than ordinary was of great avail to the fineneſs of the barley.

Time of ſowing barley—ſhould be early ſowed.

Conſidering therefore the ſmall diſpatch in ploughing the ſecond earth in the ſpring, and the danger of being late, and alſo caught in the wet, it ſeems to me moſt reaſonable to hire ploughs to help, the firſt dry ſeaſon that offers, and not to truſt to the contingency of dry weather; for, tho' you ſhould continue hiring the whole barley ſeed-time, yet you will be well repaid for it by putting your corn in early, which will carry the finer and larger body.

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[t] See the author's obſervations on Wheat.

[u] In aridiore hordeum potius quam far ſerito. Varro, fol. 34.

In Leiceſterſhire.

Captain Tate of Leiceſterſhire ſays, that it is allowed that their early ſowed wheat and earlier ſowed barley are the beſt, and that, if the ſeaſon permits, they begin to ſow barley the beginning of March;—to that therefore I muſt attribute the fineneſs of the barley of the north, ſeeing they lie wetter than we do at Eaſton, and ſeeing that we at Eaſton have finer barley than at Burclear, &c.—where they are on the clays, they ſowing as late as we do; yet there ſhould be ſome difference in ſoils, ſeeing Captain Tate named a place in Yorkſhire, where he ſaid was the fineſt barley in England, which would be ripe and in the barn in eight weeks time.

In Yorkſhire.

Time of ſowing barley on different kinds of land.

§. 55. At ſeed-time, in flinging the barley into the ground, the farmers are much governed by the ſeaſon of the year; for, unleſs the ground be very dry, and has had warmth by ſome good weather preceding, they hold it not proper to ſow their barley, in fallowed land that they ſtir again, till about a week in April, becauſe, if much wet ſhould fall on ſuch land after ſowing it would lie ſodding, and be apt to chill the corn, but on white land which they ſow on one earth, if the weather be dry, they often ſow a week before Lady-day; for from ſuch land the water runs off and ſinks down the better; beſides land ſo ſown is uſually white land that is naturally dry and warm.

Mr. Worlidge in his Kalendarium Ruſticum, fo. 270, ſays, About the end of March or earlier you may begin to ſow barley in clay-land, but not ſo early in ſandy-land.—The only reaſon of which, as I apprehend, is, that hot weather coming on apace at that time of the year, the clay-land is very ſubject to bake; therefore it is beſt to ſow barley there before the ſun has ſuch power, whereas the light land is in no ſuch danger; and ſince, as above, you find that barley to prove fineſt that is ſowed earlieſt, ſo, as clay-land naturally brings the coarſer corn, ſowing it the earlier may much mend it.

Why weeds abound in early-ſowed barley.

§. 56. It is obſerved by many, that, when they have ſown their barley very early, the crop has been almoſt eaten up by weeds; the only reaſon to be given for weeds in early-ſown barley more than in that ſown later is, becauſe many weeds and their ſeeds are of a more hardy nature than barley, and will grow early, whilſt the ſpring is as yet cold, and may get the forehand of the barley, and over-top it.

Time of ſowing barley in Leiceſterſhire.

§. 57. February 1ſt, (anno 1669) I obſerved a cloſe of about twenty acres belonging to a farmer of Hawthorne in Leiceſterſhire, which had been fallowed up but the week before, was ſowing to barley; thinking it was very early I aſked the farmer, who was in the field, whether it was common in that country to ſow ſo ſoon. He anſwered, that they generally found the barley firſt ſowed proved beſt, and ſo ſaid others whom I ſpoke to about it.—This ground kirnelled very fine, and was of a curious fat light mold, lying very warm amidſt the barns and houſes of the town, and upon a ſhoot, that neither rain nor ſnow could lie long on it.---I ſpoke to Mr. Clerk of it, and he ſaid, by the middle of February all the common-fields and incloſures would be ſowing with barley: this was as warm a winter as had been known.---He ſaid their grounds were very apt to bind by heat, and therefore the barley was better if it was pretty high; whereby it kept the ground cool againſt the time the hot weather came upon it.—He ſaid, the ſnow at this time of the year never laid long with them, but he approved of late ſowing where the ſnow lay long.---He added however, that the farmer abovementioned ſowed his barley a fortnight the earlier in hopes it might be reaped the ſooner, and ſo he might be the forwarder in his turnip-ſeed-time.

What kinds of barley to be ſown on different ſoils.

§. 58. My opinion is, that ſuch grounds as are early-ſown in a cold hill-country, the land itſelf being alſo cold or clayiſh, ought to be ſown with a late-ripe barley, eſpecially if ſuch land be declivous from the ſun, or hidden from it by hedge-rows; for the ſtraw of rath-ripe barley being in it's own nature weak, will be much more ſo where it has not it's ſhare of the ſun, and where the cold clay-ground gives off it's ſtrength ſooner, after the ſun's paſſing the ſolſtice, than other ground; on this account the ſtraw of the rath-ripe barley, for want of being ſupported and nouriſhed to it's maturity, rather withers than ripens, and then the ſtraw muſt needs crumble or fall down; and the grain will plim no farther, but dry away and be very thin; but the ſtraw of late ripe-barley, being bolder and ſtronger, will ſtand the longer; and, tho' the ſun ſhould be withdrawn, and the corn ſhould lie under a ſhade, yet, ſo long as it ſtands upright, the ſtraw will convey ſo much nouriſhment to the grain, it being ſown early, as to ripen it kindly, even notwithſtanding the diſadvantage of being ſhaded from the ſun.---Yet, if I may adviſe in this caſe, I ſhould rather propoſe in ſuch ground as lies from the ſun, or is ſhaded, eſpecially if it be clayey and cold in it's nature, to ſow white oats; for they will have finiſhed their courſe ſooner, if ſown pretty early, and will ripen before the ſtrength of the ſun ſhall be much declined.---If to avoid the aforeſaid miſchiefs late-ripe barley be not ſown, and there ſhould come a cold wet ſummer to add to the evils aforeſaid, rath-ripe barley being ſown will fall much the ſooner, even while the ſtraw is green, and will then never come to maturity, but from the roots new tillows will ſhoot forth with green ears, which will neither ripen themſelves, nor, by drawing away the nouriſhment, ſuffer the firſt and elder ears to ripen.---The reader may ſee more relating to this ſubject in my obſervations on Barley, where I have treated more largely of the nature and qualities of this grain.

Quantity of barley on an acre--Hants.

§. 59. Four buſhels of barley is generally the quantity allotted to be ſown on one acre, but, if the ground is very good, they may ſow five buſhels.

Leiceſterſhire.

Mr. Edwards of Leiceſterſhire ſowed this year (1699) four buſhels of barley on an acre, becauſe his barley was not good; when his ſeed was good he uſed to ſow but three buſhels and a peck at moſt; upon which he argued much to prove, that it was moſt profitable to ſow the beſt ſeed, for what of the other will grow, ſaid he, nobody knows.

§. 60.

If the fallows are dry, barley and oats may be ſowed earlier.

§. 60. If the fallows are very dry, barley and oats may be ſown ſomewhat the earlier; for it is a great matter to throw ſeed into a dry bed, eſpecially if cold and wet ſhould come after. Summer-corn may be killed two ways by cold, 1ſt, by the chill and coldneſs of the earth; 2dly, by the fierce ſeaſon and coldneſs of the air:---Now, if corn be ſowed when the land falls into powder, tho' cold rains ſhould fall after, yet the land will lie ſo warm as not to chill the corn; and if the root is not ſtarved, tho' the blade ſhould be taken off, that will grow again; but if ground be ploughed wet, and ſuch weather ſhould come, the corn will be in danger of being killed both ways.

Different ſeaſons of ſowing barley in the hill and vale country, in regard to wet and dry.

§. 61. The general proverbs or wiſe ſayings of our anceſtors relating to huſbandry ſeem rather to have been calculated for the vales than the hills; for the hill-country was of leſs conſequence till the late improvement of ſowing graſs-ſeeds. The ancients uſed to ſay, "barley ſhould leap on the ground, "when ſowed out of the hopper,"—which exactly ſuits the condition of the vales, where commonly they begin to ſow their barley at the latter end of February or the beginning of March, when it is impoſſible ſuch deep lands ſhould at that ſeaſon be too dry; they are rather ſubject to the other extreme; but in the hill-country, where the lands are light and poor, I have often experienced, that we have ſown in the ſpring, when the ground has been ſo dry that there was no likelihood, except rain came, of ſeeing half the corn come up, and we have often waited a month for rain; the conſequence of which has been thin barley, and an edge-grown crop; therefore, if my ground be rightly prepared by ſeaſonable fallowing, ſo as to work fine at ſeed-time, I never fear ſowing my barley too wet, provided the ground be not in danger of treading [x].

Of SOWING BARLEY and OATS.

§. 62. How much cold is an enemy to vegetation may appear from ſeeds being put into a glaſs of water; for many days they will not * chiſſum, nor imbibe the water; but their pores will rather be cloſed than opened by the water, it being cold; for which reaſon I conceive it not to be good to ſow the lenten corn in cold clay-lands, eſpecially barley, early;—for it ſeems not to be good to check ſeeds in their progreſs to vegetation, for not proceeding in that caſe is going backward, and ſuch damage may the ſeed receive in a few days, when firſt ſown, as it can never after recover.

* put forth roots.

Of oats.

§ 63. I cannot find in the four ancient authors De re ruſticâ, that any of them give any directions about ſowing oats: it ſeems they had an opinion, that they were a grain to be neglected, being, as Virgil has it, of a burning quality, and exhauſting the land, and they having other variety of corn for their cattle.—On review I find the following brief direction in Columella.

Oats

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[x] Of barley's degenerating, and cautions to chooſe the fulleſt and beſt bodied ſeed, ſee our author's remarks on Barley.

[y] Oats are ſowed in autumn, and partly cut up green for food, and partly reſerved for the ſake of the ſeed. The ſeed here to be laid up ſeems intended for ſeed again; for I cannot find any directed for feeding horſes, &c. in theſe authors. If theſe oats were to be cut green, no wonder they preferred other ſorts of leguminous corn.

Time of ſowing oats.

§. 64. I inquired of a farmer in my neighbourhood about ſeed-oats; and whether he had any to ſell: he aſked me, if I thought it not too early to ſow them yet, it being March 27, (anno 1703) for, ſaid he, I once ſowed oats at this time of the year, and in good land that I had deſigned for barley; but cold dripping weather came, and I had not two buſhels again in an acre.

Time of ſowing white oats.

§. 65. A field of mine having born three crops, the laſt of which was vetches, I ſowed the fourth with white Poland-oats: the ground ploughing very fine, and harrowing in duſt, I was the rather inclined to harrow them in on one earth, ſince I could lay them in a warm dry bed, the ground being very dry, which induced me to do it ſo early as the 9th and 10th of March, though it was ſooner than I had ever known them to be ſown.—There followed a very dry cold ſpring (anno 1713) without rain till the firſt of May, when there fell a plentiful rain, which went to the roots of all corn; one fourth part of the oats ſown never came up, and thoſe that did, looked ſpiry and weak till about the 20th of May, and then, warm weather coming, they thrived wonderfully in tillows, rankneſs, colour, and breadth of blade, ſo that it was plain the ground was in ſufficient heart; but they were ſown too early: it further appears that they were only ſown too early, becauſe the upper part of the ground, though by much the beſt, had not half the crop of oats the lower part of it had; the reaſon of which was that the upper part lay moſt expoſed to the cold.—From hence it is plain, that two or three days before the end of March, or after the beginning of April, is the time for ſowing white oats, and, if the ground be ploughed juſt before ſowed, they will lie the deeper and warmer.

Quantity of oats to an acre in the hill-country.

§. 66. Five buſhels of oats is the quantity they ſow in the hill-country on an acre;—but, if there be a ſtrong elbow-wind at the time of ſowing, there muſt be half a buſhel extraordinary allowed to an acre, whether oats, barley, or wheat, but a face or back-wind ſignifies little, nor the elbow-wind neither to peas or vetches.—There are ſome farmers among us who ſow but four buſhels, but that quantity is not ſufficient to ſeed an acre properly: though the ſeed be very good they ought not to ſow leſs than four buſhels and an half.

Quantity of wheat, barley, and oats ſowed on an acre in Leiceſterſhire.

§. 67. Hugh Clerk of Hawthorne in Leiceſterſhire, and Mr. Clerk of Ditchly aſſure me, that, on light lands in the common-fields, they ſow ſix buſhels of barley in a lugg, that is a chain-acre, though but four in clay-land in the ſame fields.—I aſked Hugh Clerk the reaſon of it; he ſaid, becauſe, if the light land was not filled with corn, it would be full of weeds. I aſked him whether the clay-land would not be the ſame, and if ſo, why he did not ſow as much on that; he ſaid, the clay-land would have as full a crop with four buſhels as the other with ſix, for from one grain the clay would put forth three, four, and five ſtalks, whereas the light earth would not yield above one or two ſtalks.—I ſaw this ſort of clay-land laſt abovementioned, and I thought it was half clay half ſand.---On the lighter land they ſow three buſhels of wheat, on the heavier but two, and of oats not above four buſhels on the light land, for, ſaid he, there is more of that grain goes to a buſhel.

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[y] Avena, autumno ſata, partim cæditur in fœnum, vel pabulum, dum adhuc viret, partim ſemini cuſtoditur. Columella lib. 2. c. 11.

White oats to be ſown thick.

§. 68. At Whitchurch farmer Perry and Mr. Bunny had diſcourſe with me about the nature of white oats :---they both on their own experience agreed that they were to be ſown very thick, becauſe they would not tillow nor multiply like black oats;—therefore, ſaid they, five buſhels ought to be ſowed on an acre.—Farmer Crapp agreed afterwards that they would not tillow like black oats; but others I find are of a contrary opinion, as I have noted in my remarks on oats. [a] Mr. Ray ſays the white oat will degenerate in poor ground, and become a black oat.—See my obſervations on Oats.

Vid. Oats 360. Of the tillowing of white oats.

Of SOWING BEANS.

§. 69. [b] Palladius tells us, it is a rule laid down by the Greek writers, that all corn of the leguminous kind ſhould be ſowed dry, except beans, and they ought to be ſowed wet.

Time of ſowing beans in Wilts.

§. 70. In Wiltſhire they ſow beans in December and before Chriſtmaſs.—Farmer Miles ſaid, it was obſerved that thoſe beans kidded beſt, and he thought the reaſon to be, becauſe ſuch beans, being checked in their ſtalk by the cold weather, did not ſpend their ſtrength, when at the ſame time their roots were getting a faſtning in the ground, whereby they ſo much the better fed their ſtalks when ſpring came; whereas the beans ſown late, having no check, run into halm, and draw faſter from the root than it can afford, and ſo the root has the leſs ſtrength for kidding.

Beans, if ſowed early on ſtrong clay-land, to be ſowed dry.

§. 71. Auguſt 30th (anno 1721) I ſhewed farmer Sartain of Broughton in Wilts the two acres and half of beans I had ſowed; the ſtrongeſt and beſt part of the ground bore the worſt beans, and the lighter land by much bore beans excellently kidded.---I had been at a loſs for the reaſon of it, but as ſoon as the farmer entered that part, which was the ſtrong and cold land, he ſaid, thoſe beans looked as if they were ſown too wet.---On reflection I well remembered, that I feared, when they were ſown, that part of the ground was too wet. Why, farmer, ſaid I, ſhould beans be ſowed as dry as peas? he ſaid yes, if ground be ſtrong clay-ground, one need not fear ſowing them too dry in February or the beginning of March, for ſo early in the ſpring the ground could not but be moiſt enough to bring up the beans.

§. 72.

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[a] Si ager paulo ſterilior ſit avena noſtra alba in nigrum degenerat. Ray, fol. 42.

[b] Omnia legumina Græcis auctoribus ſeri jubentur in ſicca terra, faba tantummodo in humida debet ſpargi. Pallad. lib. 1. ſect. 6.

§. 72. I was aſking farmer White of Catmoor in Berkſhire, how he would adviſe me to ſow horſe-beans, whether to plant them or ſow them; he ſaid, he thought in our country we could not well plant them, becauſe, our land being very ſtony, the ſtick for the moſt part would not enter the ground, and it would alſo be very difficult to hough them;—but Major Liver did not apprehend theſe to be objections, and ſaid, if I planted them, I muſt plant by a line acroſs the furrows, becauſe there is no good houghing with the furrow, the earth not being ſo well raiſed about them.---About Catmoor they often ſow beans and peas together. How to plant horſe-beans in ſtony-ground.

§. 73. Mr. Ray ſuppoſes, that the ſeminal leaves firſt ſwelling do afford the firſt nouriſhment to the nib or radicle to ſhoot, which having gotten root does again nouriſh the ſeed-leaves, which do again communicate their oleous and ſalt particles to the plant; but, ſays he, in ſeeds, whoſe leaves or ſeminal lobes do not riſe above ground, as in beans, peas, vetches, and other legumens, the radicle, as far as I have obſerved, does afford no nouriſhment to the lobes, which therefore cannot properly be ſaid to increaſe and augment, tho' they ſwell very much, occaſioned by the watery humour, that inſinuates itſelf into their pores, as into a ſponge. Ray's Proleg. fol. 28. For this reaſon the ſeminal leaves or lobes of theſe grains may not be much the worſe for ſowing, tho' the lobes are partly cut off. The root of every plant makes a beginning, and ſhoots downward before the plume ſtirs and advances upwards; for the plume is included between the lobes of the ſeed, and ſo the moiſture or vegetable parts of the earth cannot come immediately to it, and lend their aſſiſtance, as they can to the outward part of the nib, which ſends forth the root, and therefore the root muſt make it's firſt advance[c]. Of the ſeminal leaves of ſeeds. The root ſhoots firſt.

Of SOWING PEAS.

§. 74. Many good farmers I have converſed with on the ſubject of ſowing peas, agreed, if the ground was very dry, and worked pretty fine, it was beſt to ſow peas under furrow;—but, if they were ſowed under furrow when the ground was wet, and a dry ſeaſon ſhould come, the ground would be ſo ſtarky that they could not come up.—By ſowing under furrow there is this certain advantage, that the peas are ſecured from pigeons. Of ſowing peas under furrow.

Feb. 12th, (anno 1699) they were ſowing peas under furrow in the common-fields in Leiceſterſhire, and alſo harrowing ſome in.—I aſked Mr. Clerk what rule he went by for harrowing in peas, or ſowing them under furrow; he ſaid, if the land was light, they ſowed under furrow; but if heavy, they ploughed and harrowed in; or though the land was clay and heavy, yet, if it had had a froſty winter, whereby it broke and crumbled well under the plough, they ſowed under furrow, or ſometimes, though land in it's own nature light, having had an open wet winter, ſhould work heavy, they have nevertheleſs ſowed peas under furrow. In Leiceſterſhire.

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[c] See the article Beans.

The great danger of ſowing peas under furrow, the ground being wet, is, if rain ſhould come upon it, and after that a baking ſun, the earth will have a glazy cruſt at top; now a pea will ſhoot forth a ſtem or wire, which ſhall work upwards, tho' a foot under ground, but the danger is leſt the bud, or leafy ſubſtance it ſhoots out when near the top, being broad and tender, ſhould not be able to get through the ſaid cruſt, and ſo be buried.

Farmer Lake of Faccomb, a very underſtanding huſbandman, is not fond of ſowing peas under furrow; he ſays, they are ſo long in coming up that the knap-weed, and other weeds get up before them, and are apt to ſmother the peas, and if the land lies on a ſlope, it is hard to plough ſhallow enough, and ſo the peas may be buried.

Farmer Carter of Cole-Henly being with me, we were talking of peas; he ſaid, he had always obſerved, when peas are ſowed under furrow, if the furrow ploughed heavy and cloſe, ſo that the peas could not ſhoot upright, but were forced to ſhoot aſlant for a good length before they could get out, that, tho' ſuch peas halmed well, yet they never bloſſomed nor kidded well.—This is very probable, and agrees with what has been already ſet forth, viz. That where a plant receives any injury, the firſt is in it's ſeed, as being the moſt tender part, the next is in it's bloſſoms, &c. Note, It is very obvious that, where the pea runs ſlanting under a furrow before it can get out, it muſt ſpend itſelf, and it is alſo viſible, that it loſes of it's health thereby in it's being whitened and blanched.

In Wilts. The wet ſpewy clay about Holt in Wilts, of which ſort that country does much conſiſt, if kept in arable, is mad by much rain, if heat or winds follow; for which reaſon the countryman is forced to ſow his peas under furrow, and to leave the ground and furrows rough upon them, without harrowing-in the grain, in hopes that, if rain come, the ridges will molder and tumble down, and then grow mellow, that ſo happily the peas, if the ground breaks kindly, may come through the earth under which they are covered, and, if the earth be too cloſe, that they may notwithſtanding come through the ſeams of the furrows; thus their lands when finiſhed lie like ſummer-fallows for wheat, for the finer they make their grounds the faſter they bind, if rain ſhould come and dry weather follow, ſo that no peas could come through; whereas in the rough manner (above deſcribed) in which it lies, the heat and rains together contribute towards the moldering of the earth; though this way is ſubject to many inconveniencies, (as before ſet forth) yet under the circumſtances abovementioned I know not how the countryman can do better; but where ſuch lands do abound, thoſe parts of England will never get the name of corn-countries.

Farmer Reynolds, of Liverſtock in Hampſhire, ſpeaking of ſowing peas early under furrow ſaid,—it was an old proverbial ſpeech, that

" The longer peas lie in their bed
" They will riſe with the better head.

Which obſervation I have found to be true.

§. 75. Fe-

Of ſowing peas early under furrow.

§. 75. February the 3d and 4th (anno 1713) I ſowed four acres with Cotſhill-peas under furrow.—February 5th to 10th I ſowed under furrow ten acres with great grey partridge-peas; 'tis true, we had no ſtinging ſharp froſts to endanger them that way, but we had a very long cold dry ſpring with eaſterly winds, yet I could not obſerve that either of theſe peas ſuffered by being ſowed ſo early, but flouriſhed much the better for it.

In Wilts.

Iles, my tenant in Wilts, and Smith of Dead-houſe had ſown the ſame grey partridge-peas under furrow the 25th of January in mellow good ground, and throughout the ſpring I obſerved the halm to flouriſh very well, but at harveſt, there having been an exceeding dry ſpring and ſummer, they, like the generality of the peas of that country, bore very ſhort, and but few kids, whereas I had long ones, and my halm extraordinary well kidded, not only of this ſort, but all the ſorts of peas I ſowed, viz. blue-peas, and poplings, early in their ſeaſon, which I attributed to the ſummer-fallowing my ground.

To plough up the ground in the hill-country ſome time before you ſow rath-ripe peas.

§. 76. I am clearly of opinion, that in a cold hilly country, and more eſpecially if the ſoil be clay, which is therefore the colder, if you ſow any of the rath-ripe peas, which are the tender ſort, ſuch as poplings, blue-peas, or Henley-greys, it is prudent to plough up the ground a fortnight or three weeks before it be ſown, that it may be dried and mellowed by the air, wind, and ſun, and then to take an opportunity of ſowing the peas when the ground is in the temper above deſcribed, which cannot in ſuch a ſituation be too nicely regarded; for the common way of ſowing after the plough the latter end of February, or beginning of March, eſpecially if the grain be tender, is ſtill the more improper, becauſe the earth will at that time turn up a little moiſt and cold, which ſo early in the year chills corn; whereas by turning up the ground a fortnight or even a month before you ſow it (according as your ground may require time for mellowing) you'll be able to command a fit time to ſow your ſeed in, a few dry days rendering land chaſtened, dry, and friable; nor will land ploughed up dry in a cold country ſo early as January or February be apt to bring weeds by lying fallow.—I would alſo recommend the ſame way for oats or barley, if ſowed by the middle of March, before the weather is warm enough to ſet the ſeeds of weeds a growing by the earth's lying in ſuch manner tilled.—But when I recommend the ploughing up of land a fortnight or even a month before it is ſown, it is not meant of ſtrong land; which will not by ſuch time be brought to harrow, nor of light ground, which works knot-fine; for, if rain in the interim ſhould come, ſuch ground will quatt, and the furrow will fill up, and lie ſoggy and wet long after; but ſuch ploughing beforehand is meant of ground, which for the moſt part will hold a furrow, or plough with ſome roughneſs, yet ſo mellow as to ſhatter either by dry or rainy weather.

Difference of peas in hardineſs.

§. 77. Being in Wiltſhire I inquired of the farmers, viz. farmer Earle, Mr. Smith, &c. why they did not ſow popling or grey Burbage-peas; I found they thought thoſe peas too nice to ſow in their cold lands, and ſaid

they

Beſt to let the land lie unharrowed ſome time after ſowing peas.

they did not do well with them, but that the hot and ſandy lands about Scene and the Deviſes might be very proper for them.—Note, It is my opinion, when any pea is ſowed early under furrow, if the land be ſomewhat mellow and friable, as in that caſe it ought to be, and alſo to be very dry when the peas are ſowed, the beſt way is, after the peas are ſowed, to let the furrows lie unharrowed for ſome time, it may be for three weeks or a month, for the roughneſs of the ground will be a great means to keep the peas warm from froſts and winds, and dry from rain, whereas, if ſuch land be harrowed off fine, immediately after the peas are ſowed, it will lie wet and cold a long time in January or February before it can dry again, that being the wet ſeaſon of the year, and no ſun to dry it; but if ſuch land be harrowed only two or three tinings a month after ſowing the peas, they lying deep will only have rooted, but not ſprouted, nor will any of them be torn up by the harrows; this method will protect the peas from cold till the fierceneſs of the ſeaſon is over, and ſecure them a warm bed at firſt putting in by the furrows covering them and ſhooting off the rain, which is of vaſt conſequence to all ſorts of corn.

Peas chilled by being ſowed after ſnow.

§. 78. A neighbour of mine ſowed peas on fallows, being dry and in good order, but, before he could finiſh the harrowing them, came a ſnow; after the ſnow was melted, which was in a day or two, he ſowed more in the ſame ground, being of the ſame goodneſs, and harrowed them in, the ground working pretty well, but not ſo well and mellow as the former: of the peas of the firſt ſowing he had treble the crop he had of the latter ſowing.—I conceive, for the ſolving theſe two notable inſtances, we may compare corn to an egg, which has the ſanguinea gutta, of which Pliny ſays, "certò ſaltat palpitatque," and the many damages that ſanguinea gutta receives on the firſt incubation, either by thunder or ſhaking, or chill the egg takes, are reckoned up by the Roman writers. Now, in like manner, in the germen of corn there is a punctum ſaliens, a minute vital principle, which moves, and which receives an immediate check, if laid in a cold bed, which has a notable ill effect throughout it's whole progreſs of vegetation afterwards; and a warm dry bed, which enlivens it, has, on the contrary, a good effect. I think there is no room to doubt but that there is an innate action in ſeed, more than is merely mechanical, implanted in it by God Almighty, (it is this, which in it's punctum ſaliens, inclines the root to take downwards, and the ſtalk upwards; otherwiſe the firſt conduct in vegetation is unaccountable) and that the ſeed has this power of action ſeated in itſelf purely relative to the thing it performs, and confined only to that; nor is this ſtrange, ſeeing the union of the ſoul and body in man cannot be reſolved without flying to Omnipotence; it is the ſame of the animal life with the body of brutes, and it is plain the things of this creation move within peculiar ſpheres of ſubordinate gradations; we may therefore well believe there is a power of action thus confined, which partakes not of any agitations; this may be termed a moving ſpring, elater, or pulſe; nor is it raſh to affirm ſuch a motion we cannot ſee; for who can ſee the motion of the

Of the punctum ſaliens in ſeed.

index of a clock? and yet, that a motion can be a thouſand millions of times leſs, none can deny.

Of drilling peas on light ground.

§. 79. On lightiſh or whitiſh ground, or ſuch ground as one may ſuſpect to be too light for peas, in my opinion they ought to be drilled when ſowed, and drilled at a tolerable diſtance, that a ſufficient quantity of earth may be houghed up to cover the roots of the peas, in order to keep them moiſt, and to break the ſcorching heat of the ſun, which brings blights, choaks them up in bloſſoming-time, and occaſions other evils, which may be the chief reaſon of drilling about Burbage.

Peas—the ſeaſon of ſowing them.

§. 80. I aſked ſeveral knowing farmers when was the beſt ſeaſon to ſow peas. In this country, ſaid they, peas as well as vetches require to be ſown early and when the ground is dry; if they are ſowed when the ground is very wet, or if much wet falls upon their being ſown, they will be apt to burſt, and ſwell out of the ground, ſo that they'll lie above ground.—I aſked them, how it could be that a pea could ſwell out of the ground; they could not tell that, but one of them ſaid, he believed there was no more in it than that the rain waſhed the earth from them.—I aſked them, what they meant by an early ſowing, and when was the beſt time to ſow peas; the farmer laſt mentioned ſaid, he thought the latter end of February;—the reſt agreed to it, and ſaid, if they were ſowed ſo early they would be likely to kid before the blight came, which otherwiſe would breed a catterpillar that would eat them up.—They told me little yellow worms ſometimes would ſwarm on them.

Where elms, maples, and furze are, the butterfly, that breeds the catterpillar, lays her eggs, rather than in the peas, which ſhews inſtinct for the good of her kind; for the butterfly chooſes what is beſt for the nouriſhment of her brood, not herſelf, who is fed by the juices of flowers, and the honey-dews.

It was January the 18th when my bailiff aſked me when I would ſow the farther part of a certain field to peas; he ſaid, he would not adviſe me (unleſs I ſowed them under furrow) to ſow them till a week within, or the middle of March; for, ſaid he, the land has been hard driven, and is but poor, and, if ſowed too early, the peas may come up and receive a check by cold weather, which they will hardly recover; it is the ſame with oats; therefore, ſaid he, about the middle of March is the beſt time for ſowing peas in poor land, but, if you ſow them under furrow, they may be ſowed the latter end of February, becauſe they will require a longer time to come up.—Aſhmonſworth-down is poor land, and they are ignorant when to ſow it, and commonly they ſow it too early, whereby I have known that ground to have had three ſtarts, and as many checks by the cold weather, which has brought their crop to nothing;—it is true, added he, farmer Bond ſows peas the latter end of February, but then his ground is good ground, and lies warm.

To be ſown early.

I find it is the opinion of the beſt huſbandmen in theſe parts, that a good crop of peas depends very much on the early ſowing them.—Major Liver ſays he never miſſed of a good crop, if he ſowed early, tho' in the coldeſt part of the whole farm.—He ſaid, it being then February the 12th (anno 1701) if the ground had been dry enough he had ſown peas before that time.

Mr. Edwards aſſures me that on Chriſtmaſs-day farmer Elton ſowed the Cotſhill-peas, and never had a better crop.

The hotſpur pea to be ſown late.

If you ſow hotſpur-peas in the field, ſays Mr. Randal, you muſt not ſow them till May, becauſe, if they ripen before other corn, the birds will devour them.

Of ſowing different ſorts of peas.

This year (1715) I ſowed an hundred acres of peas; part of the land I ſowed with great partridge-peas, both under and on furrow, from the beginning of February to about the 20th day: theſe peas were ſowed dry, and they flouriſhed exceedingly, holding their own, and proſpering throughout the ſummer.—March 19th I began to ſow the reſt of the land with blue peas and poplings; theſe peas were all ſtunted, and continued in an unthriving condition, with a ſmall leaf, and pale of colour, till about the 8th of June, when by means of warm weather they grew eſtabliſhed and mended in all reſpects, and got into a thriving way; yet theſe peas were ſown when the earth worked well, and was in ſeaſon, all the peas-land having been ſummer-fallowed. The reaſon of this difference between the proſperity of the great partridge-peas, and that of the blue peas and poplings I take chiefly to be this, that cold dry churliſh winds coming, and cold rains falling from the latter end of March till the middle of May; though they had very little or no ill effect on the great partridge-peas ſowed the beginning of February, becauſe their roots were not only well eſtabliſhed, but the ground was alſo by that time ſettled to them, yet the blue peas and the poplings had not eſtabliſhed their roots, nor was the ground ſettled to them, and ſo they became paſſive both to the cold winds and the cold rains.—If it be objected, that the great grey partridge-peas are much hardier than the blue poplings, and that the difference might lie in that,—I anſwer, 'tis admitted that the great partridge-peas are a hardier ſort of peas than the blue peas or the popling-peas; but there being at leaſt five weeks difference in the time of their being ſowed, that ſets them on the level with each other in reſpect to their hardineſs and tenderneſs.—And if it be farther objected, that cold churliſh winds and cold rain might as well have fallen on the former as on the latter ſort of peas, ſoon after the great partridge-peas had been ſown,----I anſwer, we had a great deal of ſuch weather then alſo; but by conſtant experience I have obſerved, that peas ſowed very early, the ground being dry, and in good order at the time of ſowing, do bear the cold weather, cold rain, and cold wind, which then happens, better than the peas ſowed from the beginning to the middle or 20th of March do bear the ſame ſort of weather, which uſually falls about that time of the year, without reſpect to the tenderneſs of any particular ſort of peas, (for I have ſown both blue peas and popling-peas the latter end of February) becauſe it fares with grains, cæteris paribus, as with our bodies, viz. that cold rains, cold winds, and cold air in the months of April and May pinch us, and make us more ſenſible of their effects than thoſe of February and March, when our pores are cloſer, and the capillaries hardened; for in April and May the ſun-beams play on us by lucid intervals, and open and ſoften the pores and capillaries, whereby the cold penetrates deeper, and we are more ſenſible of it; and thus ſtands the difference between the young tender roots of the latter-ſowed peas, viz. the blue and popling-peas, becauſe they are tenderer, and the great grey peas ſowed earlier, becauſe they are hardier, and ſo their roots are hardened, and ſtruck down deep into the earth, and the earth is well ſettled about them before the ſun from April to June acts by fits on the ground to the prejudice abovementioned, whereas otherwiſe, as hardy a pea as the great grey partridge-pea is, the ſtalk and leaves, if ſowed at the time the other peas were, would ſicken alſo upon the ſame occaſion.—It may be demanded now what remedy can there be preſcribed to help this; I anſwer,—By all means roll theſe latter-ſown peas the firſt opportunity of dry weather you have, after you have ſown them, the ground being then alſo dry; thoſe ſowed the beginning of February need it not; but be ſure to roll the latter-ſown peas as ſoon as you have half or a whole day's work for a team cut out, (which we commonly reckon from ten to twelve acres) and delay it not out of impatience to ſow your whole crop of peas firſt, for ſuch delays are fatal; a team that rolls ten or twelve acres in a day, can in lieu of it plough but one acre.---Note, I and the whole country neglected ſnatching this opportunity on account of dripping weather, but dearly paid for it.

Caution—to roll the latter-ſown peas.

§. 81. Of the great grey Cotſhill-peas three buſhels and an half uſed to be ſown on an acre, but the ground about Crux-Eaſton is not good enough for them; of the grey partridge-peas they ſow here three buſhels on an acre.

The quantity of peas on an acre.

This year (1700) peas being houſed dry, the more will go to a buſhel; ſo poſſibly three buſhels and a peck may do to ſow an acre; otherwiſe it is beſt to ſow four buſhels; for peas, according to the countryman's obſervation, never thrive well till they can take hands with one another, that is, by their ſtrings, which they can never do if ſowed thin: when they can climb up by one another they ſhade the ground.

July 20, 1701, I obſerved my peas, being well kidded, were fallen on the ground about three weeks before they ought to be hacked, from whence I did infer another benefit from ſowing them thick, viz. that, by handling one another, they were able to ſtand up the longer before they were pulled down by the kids, whereas by being pulled down too ſoon, if wet weather ſhould come, both kid and halm might rot. Farmer Biggs ſays, he had a ſervant that one year ſowed five buſhels of peas on an acre, for which he was very angry with him, but however he never had better peas.

Palladius tells us, and Columella and Pliny agree with him, that peas are to be ſown the latter end of September, in light, mellow earth, and in a warm moiſt ſituation, and we have ſeen indeed, that this dry ſummer, 1705, has been more ruinous to peas than any other ſort of grain. The quantity Palladius preſcribes to be ſown on an acre is four modii, or three, he ſays, may be ſufficient; whereas we ſow four buſhels, that is eight modii, tho' we begin not till March, and of vetches we ſow not ſo many as the Romans [d].

Of SOWING VETCHES.

§. 82. Palladius ſays, vetches ſhould be ſowed as early in the morning as the dew is off, and ſhould be covered in before night, for otherwiſe the moiſture that falls in the night may corrupt and deſtroy the ſeed.

Winter-vetches to be ſowed dry and early.

§. 83. Farmer Elton told me, it was agreed to be beſt to ſow winter-vetches dry; the ground could not be too dry for them; he ſaid they were a ticklifh grain, and it was good to ſow them early, by Michaelmaſs;—but, ſaid he, I once ſowed them when it was ſo deep in wet that my horſes trod as deep as the plough went, being loth to let them lie ſtill, and people who came by thought me mad, but I never had a better crop of vetches.—Three days after I dined with Mr. Whiſtler, and, ſpeaking about vetches, I ſaid they were a ticklifh grain; yes, ſaid he, but they need not be ſo, if people pleaſed; for I was told it by a wiſe huſbandman forty years ago, and have found it true, that, if you ſow vetches very early and dry, you'll have vetches enough.--What, by Michaelmaſs would you have them ſowed? ſaid I.—Ay, ſaid he, by the firſt of September if you can; the winter then will never hurt them; they are to be ſowed at a leiſure-time, when the ground may be too dry for ſowing wheat.

To be ſowed dry.

Between the 29th of Auguſt and the 4th of September, 1719, I ploughed and ſowed to vetches eighteen acres of a barley-ſtubble, which had been ſowed to corn for ſeveral years before: the whole ſummer having been exceeding dry, the ground ploughed in aſhes, and had no moiſture to bring up the corn; I choſe however to ſow it in this condition, (tho' I had no proſpect of the vetches growing without rain) becauſe I was apprehenſive, that, if rain came, the ground might fall ſo flat, and ſo cloſe together, that I ſhould not bury the vetches. By the fourth of September aforeſaid I had ſowed to vetches another field of fourteen acres, a wheat-ſtubble, it being alſo all in duſt. After ſowing I trod them both with ſheep. Notwithſtanding this great drowth, yet by the 19th of September the vetches in both theſe fields were come up, thick enough for a crop; ſo that it muſt be concluded, by the beginning of September there is, by night, a coldneſs and moiſture in the air, which enters the earth, ſufficient to make a vetch grow: barley alſo is of the ſame nature, for the barley by this time came up very thick in the firſt mentioned field among the vetches, I having ploughed in the barley-ſtubble.—The ſowing of vetches in this manner ſucceeded to admiration, for, as they came up at firſt extremely well, ſo they held their own all the winter, and when I viewed them the 7th of June (the time of noting this obſervation) the whole crop ſtood as thick on the ground as the ground could well bear, inſomuch that it was not only the moſt flouriſhing but the thickeſt crop I ever had; for, judging from their thickneſs, one would conclude that every vetch took root and grew.

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[d] See the article Peas.

Or, for want of an early ſeaſon, to be ſown very late.

Mr. Edwards ploughed for vetches about ſeven or eight days within September, but it happened to be ſo wet he could not ſow, nor could he harrow till the 24th of October, when he told me he would not ſow them till towards Candlemaſs, for that the middle time of ſowing vetches (about St. Leonard) was the worſt of all; he allowed the early ſowing was the beſt; but, ſaid he, the middle ſowing, which is about the beginning of November, and ſo on, is the worſt, becauſe there is warmth enough in the earth to bring up the vetch, which will in all likelihood be tender when the froſt comes, and ſo be cut off by it, whereas what is ſown the lateſt, ſuppoſe before Candlemaſs, when the ground is cold, will, if froſt and cold weather come, lie buried without coming up, and ſo take no harm. This to me ſeems to ſtand to reaſon.

Seaſon of ſowing goar-vetches.

§. 84. I have found by experience, that it is not good to ſow goar-vetches ſo late as the beginning of May; for they will not, if it ſhould prove a wet cold ſummer, come to a good growth and bulk, and yet will be very groſs and ſappy, and unfit for horſes, eſpecially when the heat of the ſummer is going off, as towards the latter end of Auguſt; and, if you deſign them for dry fodder, they will be ſo late ripe, that their groſsneſs will occaſion their lying out ſo long, as to be in great danger of being ſpoiled.

Miſchief from ſowing winter-vetches wet and late.

§. 85. At autumn (anno 1719) I was ſo late in ſowing that I could not ſow winter-vetches till the 18th of October, and got finiſhed by the 24th.--- The ſeaſon was too wet, and the ground ploughed and harrowed as heavy, but not heavier, than we generally deſire it ſhould for wheat, not ſo wet as to tread in when harrowed; the winter continued very mild to the beginning of February, when there came a little froſt; yet the vetches never thrived, but looked very dwindling, and of a ruſſet colour, which I imputed to their being ſowed ſo wet, and ſo late in the year: I believe, tho' the ground had been as wet as it was, they had not ſucceeded ſo ill had they been ſowed five or ſix weeks earlier; and yet this ground was in a very friable condition, not clay, but a mixed land, and lies on a deſcent to the ſouth-eaſt. The vetches continued in an unthriving way till the firſt of February, when a hard froſt came with an eaſterly wind, which held for a month, and it killed the whole crop root and branch.

Ground ſloping to the north to be ſowed early for winter-corn.

§. 86. If a ground lies aſlope to the north or weſt, the earlier you ſow it for winter-corn the better; becauſe in Auguſt and September the days ſhorten apace, and ſuch grounds have but little ſun then, not ſo much as to make early-ſown corn winter-proud; beſides, ſuch corn will ripen the ſooner, before the ſun loſes it's ſtrength over ſuch grounds the following ſummer.---I ſowed at the latter end of September, 1702, vetches in a field that lies from the ſun, the ground being alſo poor; they kept blooming to the laſt of Auguſt, and yet were very ſhort, and the land was white land. I ſowed wheat, juſt by the ſaid vetches, after Michaelmaſs, which ripened as early as any; but then the ground was very well maintained, which muſt make the difference.

Quantity of vetches on an acre.

§. 87. If vetches be dry they ſow two buſhels on an acre; if ſwelled with being moiſt, two buſhels and an half, becauſe they take up more room.

Three buſhels of winter-vetches on an acre is more than is commonly ſown, eſpecially on white land, becauſe they generally kid well on ſuch land, but I think three buſhels not too much for red land, becauſe they may kid the better for it, and not run ſo much to halm.

To ſave ſeed for ſowing the next year.

§. 88. It is good to have ſuch plenty of winter-vetches, as to be able to ſave ſeed in halm for ſowing the next year; becauſe it is beſt to ſow them early, i. e. by the beginning of September, vetches of the ſame year's ſeed being ſeldom ripe ſo ſoon, nor can they be got to be threſhed till Michaelmaſs.

Care not to be impoſed on in buying ſeed.

§. 89. A neighbour of mine was impoſed on, and inſtead of the winter-vetch bought the ſummer-pebble-vetch-ſeed, which he ſowed, and, though the winter proved mild as ever winter did, yet in March they were all dead, and the land was ploughed up again; which I mention as a caution to others. The pebble-vetch is a ſummer-vetch, different from the goar-vetch, and not ſo big; they call it alſo the rath-ripe vetch.

Vetches two year old will grow, alſo peas.

§. 90. I was telling farmer Pocock of ——— near Hungerford, that I had ſown winter-vetches two year old, being well houſed, and that they came up well.——He replied, that he had ſown great partridge-peas the ſecond ſpring after the harveſt, and they grew very well; but, ſays he, I kept them in the mow till near the time I ſowed them, for otherwiſe, as he ſuppoſed, had they been threſhed long before ſeed-time, they would not have grown ſo well [e].

Of SOWING TILLS.

Tills beſt on good land.

§. 91. Going from Crux-Eaſton to Holt I obſerved in the fat ſtrong clay-lands between Pewſey and Deviſes beans on one ridge of land, and tills on another, and ſo to continue interchangeably for ſome miles.---I thought tills had always been ſown on light and poor land; therefore I aſked a farmer I met whether tills grew well on ſuch land; he ſaid, the ſtronger the land the better the tills.---I aſked him if they ſowed not tills on two earths, the ground being ſo heavy; he ſaid, ſometimes they did, and ſometimes on one earth, as the land worked. Again I aſked him, when they ſowed the tills, he ſaid before their barley, that is in March. I found by him that two buſhels, and two and an half were ſowed on an acre: the tills on that land were the beſt I ever ſaw.

Time of ſowing.

Quantity on an acre.

To ſow barley with tills.

§. 92. I was adviſed by the country-people, where tills are much ſowed, to ſow a buſhel of barley in every acre of tills; they ſaid it would ſerve the tills to climb up by, and the rudder would eaſily ſeparate them.

§. 93. I

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[e] See the author's remarks on Vetches.

Quantity on an acre.

§. 93. I told my neighbouring farmers that between Pewſy and the Deviſes, in mighty ſtrong land, they ſowed two buſhels, and two buſhels and an half of tills on an acre. They replied, it muſt then be becauſe, their land being ſo ſtrong, if not ſowed thick, they would run too much to halm, but in poor land they thought a buſhel and a peck on an acre was ſufficient.

Of SOWING GRASS-SEEDS.

§. 94. That ſeeds will not grow unhulled, or extra cotyledones, ſee the Experiments made by Malpigius in beans, lupines, &c. yet quære; for we know hop-clover unhooded grows well; but then that hood ſeems the pod rather than the rind or cotyledon, the rind going and growing with the ſeed ſtill. The bran or cotyledon is taken off of oatmeal; quære of that therefore, and whether it will grow.

Method of ſowing clover in Surry.

§. 95. James Young my tenant in the Iſle of Wight and I were talking of clover-ſeed: he ſaid, he had been acquainted with a huſbandman who lived about Guilford in Surry, who told him, the method of ſowing it there was, after the barley was ſowed, to roll the ground, which laid it ſo ſmooth that the clover-ſeed might be delivered as even as you pleaſed, and then to ſow it, and give it a tining-in.

Of ſowing clover-ſeed with wheat, barley, &c.

§. 96. My bailiff, who was many years a farmer, aſſures me, that in the hill-country of Wiltſhire he has often known hop-clover and broad-clover-ſeed ſowed with wheat, and it has born the winter very well; he has likewiſe ſometimes known clover-ſeed ſowed among green wheat in March, without harrowing it in, with good ſucceſs.--Another, a Wiltſhire farmer, told me he had often known hop-clover ſowed with the wheat in Wiltſhire, and he thought it the beſt way, eſpecially if the ground was out of heart, for then it would pay better than taking a crop or two of corn after the wheat; one gets a year's forwardneſs of the clover by it.---He ſays likewiſe, that not far from Puckſhipton, where the ground is pretty rich, he has known the hop-clover ſowed a month after the barley, leſt it ſhould prove too rank.

Of ſowing broad-clover with wheat.

§. 97. In September, 1719, I ſowed broad-clover-ſeed with my wheat on twenty-nine acres of land; I dunged about ſeventeen acres of it with cow and horſe-dung, and the reſt with the fold, or with pigeons-dung, or malt-duſt; I laid, I believe, near forty load of pot-dung on an acre: it proved an exceeding mild winter, with a cold and wet ſpring and ſummer, inſomuch that near a month before harveſt the wheat lodged: I had a very great crop of wheat, yet, notwithſtanding the dunging, and the mildneſs of the winter, and the frequent rains throughout the ſpring and ſummer, the broad-clover did not at all injure the wheat, though the wheat-harveſt did not begin till the 20th of Auguſt; then I began to cut this wheat, but the broad-clover was neither rank nor high, ſo as to prejudice the wheat, but ſeemed rather to be too thin ſet on the ground, nor had it made any effort towards flowering; yet by a fortnight after the wheat had been cut the broad-clover appeared very thick on the ground, even ſo as in many places to be matted; the leaf alſo was very rank, fat, and groſs, notwithſtanding much natural graſs grew up with it.—What deſerves farther to be obſerved in this caſe is, that in the ſpring of the year the wheat came up ſo very groſs, that, for fear of a lodgment, I was forced to put my whole flock into it for three mornings to feed it down, and they without doubt fed on the young broad-clover as well as on the wheat, yet it ſeems ſuch feeding did the broad-clover no harm.

Of ſowing broad-clover in wheat in ſpring.

§. 98. The 10th of October (anno 1720) I went into my neighbour's wheat-ſtubble to view the broad-clover he had ſown among his wheat in the preceding ſpring, and before he had rolled it.—He was of opinion it ſucceeded very well.—I found the broad-clover to have come up very thick, but it had a very ſmall leaf, and was leſs ſappy than my broad-clover ſown when I ſowed the wheat, which makes me conclude, that the ſeed ſown ſo late could not penetrate with it's root into the ground ſo well as mine, nor find nouriſhment and maintenance like my broad-clover ſown with the wheat, when the ground was new harrowed; therefore it is my opinion, that, when ſpring comes, the late-ſown ſeed will decline and fall off.—I alſo obſerved his clover thrived better where the ground was mere clay than where it was a mixed earth; and note, this had been a very wet ſpring and ſummer; otherwiſe, ſowing his clover as he did, he would have had but little come up.

Broad-clover damages barley, if a wet ſpring and ſummer ſucceeds.

§. 99. This harveſt (anno 1720) farmer Crapp of Aſhmonſworth, Hants, aſſured me, that, it having been a wet and cold ſpring and ſummer, he was worſe in his barley by 40 l. for ſowing broad-clover with it; for four or five weeks before harveſt the broad-clover had ſo eat out the barley, that the ſtraw dwindled, and carried no ſubſtance, and the barley had but a thin body, and, when it comes, ſaid he, to be threſhed on the floor, it will threſh ſo heavy, that there will be no threſhing it out for the broad-clover, which will deaden the ſtroke of the flail.—He ſays, if broad-clover be ſowed with oats, it does not do well on one earth.

Of ſowing it with rath-ripe barley.

It ſeems to me, that, ſince broad-clover muſt be ſowed in good ſtrong clay-land, the rath-ripe barley is the fitteſt to be ſowed with it, becauſe it alſo requires good land, but more eſpecially becauſe it will be early ripe before the broad-clover can grow to that height as to prey much on the barley, or ſo that ſwarths of it muſt be cut with the barley, which may occaſion the corn's lying out the longer, for the broad-clover to wither; it will alſo be cut before that time of the year, when the dew falls in great quantities on the broad-clover-graſs, which would prevent the barley from being dry enough to be houſed.

Of ſowing it with oats.

Since ſo much has been ſaid of the damage that broad-clover often does to a crop of barley, for the better ſecurity againſt ſuch evils, it ſeems reaſonable to me, to lay down to broad-clover with a crop of oats: firſt, becauſe, being ſowed earlier with oats than with barley, it will not be in danger of growing ſo rank.—Secondly, tho' it ſhould grow rank, it will not prejudice the oats as it would do barley, becauſe oats may lie abroad a week after they are cut, and take rain without damage.---Thirdly, the ground laid down to oats is commonly in a poorer condition than ground laid down to barley, and therefore the broad-clover will be leſs liable to grow too rank.---Fourthly, oats are generally ripe before barley, and houſed before the feeding weather of autumn comes, eſpecially on the latter-ſown barley, which ſets the broad-clover a growing, and makes it very rank before the barley can be cut.

The farmers of Wiltſhire chooſe rather to ſow broad-clover with black or white oats than with barley, provided the ground works up mellow, and they ſay, the broad-clover will be the better crop, and the more certainly ſo, for being ſowed ſo early as the oat-ſeed-time, nor will it ever hurt the oats.

This whole ſection is inſerted p. 71. §. 12. under the article Harrowing; but the firſt paragraph ending with the words—to tear it—is repeated here.

One of them, a very underſtanding man, ſpeaking in relation to his ſowing broad-clover with his oats, told me, that he always dragged them in with their country-drags (which are not ſo big as our's, and have ſix tinings on a harrow) and this he does, tho' his ground had been ploughed up but a fortnight before; but he commonly ſows broad-clover on ground ploughed ſo long before as Candlemaſs, which never will, tho' it works mellow, fall too cloſe for the drags to tear it.——

Of hop-clover ſown on wheat-ſtubble without harrowing.

§. 100. Mr. Randolph and Mr. Short Baily of Wiltſhire diſcourſing with me about hop-clover-ſeed, Mr. Baily aſſured me, that having once two or three quarters of hop-clover-ſeed by him, and having a wheat-ſtubble, which he obſerved the following ſpring to be pretty clear of weeds, and pretty hollow, he flung in his hop-clover-ſeed without harrowing it, and had as good a crop as at any other time. This he ſaid on an occaſion I gave him, by ſaying, I would try an experiment on my ſide-lands by ſowing them with rye-graſs at ſpring, on the oat-ſtubbles, harrowing them in.

Of ſowing hop-clover with French-graſs.

§. 101. A noted farmer, near Uphaven, informed me, that it was the beſt way to ſow hop-clover with French-graſs; that he ſowed ſeven buſhels of French-graſs on an acre, and with it a good ſprinkling of hop-clover; the advantage of which was, that it filled up thoſe ſpaces that miſſed between the French-graſs, and kept down the weeds till ſuch time as the French-graſs could overcome all.

Of ſowing French-graſs and clover under furrow.

§. 102. It is my opinion, that, if the ground works light and fine, French-graſs-ſeed ought to be ſown under furrow, becauſe (as I have elſewhere obſerved) if it be ſown on furrow, it is apt not to be healed.—To which add, that French-graſs-ſeed in it's huſks, being very prickly, is not apt as the harrows move, to fall deep into the earth, and tho' fallen deep enough, yet by means of the prickles which catch hold of the earth, it is apt to be harrowed up again.

About Crux-Eaſton the farmers think they cannot ſow graſs-ſeed too deep, ſowing it often with corn, and harrowing it in afterwards; and I have known hop-clover mowed for ſeed, which, ſtanding too long, ſhattered, and after the graſs was mowed wheat was ſowed under furrow; the ground was harrowed fine, and the hop-clover came up with the wheat as thick as could be deſired, ſo that I am ſatisfied, if the earth be light at top, there is no danger of burying it.

March the 12th (anno 1707) I ſowed French-graſs-ſeed under furrow: no rain material fell till the 22d of May, being near ten weeks, during which time the ſun was very hot with dry winds and cold nights: in this dry time I often ſcratched up the ground, and found the lobes or ſeed-leaves out under ground, but, tho' ſown under furrow, at a perfect ſtand, not able to advance farther without rain, and before rain came, the ſeed-leaves did a little languiſh, and ſeem to have ſpent their ſtock of juice, ſo that I began to fear the crop would die under ground; but plenty of rain coming, I did between the 30th of May and the third of June obſerve the ſeed-leaves coming plentifully out of the ground, which was near three months after ſown. I likewiſe obſerved ſome oats, ſown under furrow the 18th of March, appearing the firſt of June;—I alſo obſerved many ſtems of theſe French-graſs-ſeeds to be bit off under ground, by worms, they not being able to get food above ground by reaſon of the drought: the inſects of the field are a great prejudice.

Damage from worms.

Graſs-ſeed may fail by ſowing it on wet fallows.

§. 103. Many have ſown graſs-ſeeds when fallows have worked wet, and have had no graſs, which might as well happen from the wetneſs of the ground as the badneſs of the ſeed; for if barley, which carries ſo ſtrong a blade, can hardly get through ground that binds by wet, how ſhould it be expected of graſs-ſeed ſo ſown, the blade of which is ſo much weaker and tenderer? I alledged this to a good farmer of my acquaintance; he replied, that, as he thought, graſs-ſeed could not fall in ſo deep as to be bound.—I anſwered he was miſtaken, for the laſt tining of the harrows let in the graſs-ſeed as deep as the firſt did the corn, of which I convinced him by going out and digging up the ſeed.

Broad-clover, &c. to be ſown thick.

§. 104. I hold, that in the hill-country, broad-clover ought to be ſowed thick, becauſe the graſs will be finer for ſheep, not ſo groſs as otherwiſe it would be, and conſequently, if rain falls, it will quickly be dry, and, if rain ſhould not fall, the hay, when mowed, will be the ſooner made by four or five days, and being cut in it's juice before the flower dies, it will not take the damage that it would do, provided it was cut ripe.

I was complaining to farmer William Sartain of Broughton in Wiltſhire that my broad-clover at Eaſton was very ſour, occaſioned by the coldneſs of the land—He ſaid, if I ſowed twenty pound of broad-clover on an acre inſtead of twelve or fourteen, I ſhould find it the ſweeter and finer for it, and it might be farther improved in ſweetneſs, if I fed it very cloſe, and did not let it grow to any height.

In diſcourſe with Mr. Randolph, and Mr. Short Baily of Wiltſhire, Mr. Randolph highly commended the ſowing all graſs-ſeeds in a greater quantity than was practiſed, eſpecially, ſaid he, French-graſs-ſeed; for, if it be not ſowed thick, if a hot ſummer comes, it will burn, and other graſſes, if they be not ſowed thick, will grow groſs, and then, if at mowing-time a difficult ſeaſon ſhould come, the crop muſt ſtand till it is a little over-ripe before it be cut, and ſo it will loſe it's goodneſs, whereas, had it been fine by means of ſowing thick, it would take little damage.—In Wiltſhire they generally ſow three or four buſhels of rye-graſs-ſeed upon an acre, and Mr. Raymond adviſed me by all means to ſow no leſs than three buſhels of hop-clover on an acre; for, ſaid he, if you ſow but two buſhels, you will find abundance of vacancies, which would have carried graſs, had the ſeed been dropped there, the vacancy not being for want of ſtrength in the land, but becauſe it had no ſeed fell in it.

Of conical ſeeds.

§. 105. Seeds or kernels that are conical, as much as I have obſerved, have their root and ſpear at the narrow end, whereby, when they fall, that end inclines moſt to the ground [f].

EXPERIMENTS on the GROWTH of SEEDS.

Of the pearly drops on barley, and their uſe.

§. 106. I had often obſerved in the ſpring-time, when the blades of barley firſt began to ſhoot out of the ground, dewy drops ſtanding every morning on the points of the blades, even when the graſs of the field, which was run into leaf, had ſome mornings no dew thereon; this made me believe they proceeded not from the deſcending or circumambient vapours of the air, but from juices drawn up by the roots, which paſſed upwards through the tubes and iſſued out at the top, which according to my conjecture was true, as appears by this experiment I made.—I took a pot of fine garden-mold, and placed it in my ſtudy; the earth was but moderately moiſt, and I put into it a handfull of barley; when the barley ſhot up about half an inch or an inch, at the end of the points appeared the ſaid pearly drops; I wiped them all off, and carefully took up half a dozen of the blades of barley by the roots, then with a pair of ſciſſars cut off the roots cloſe to the grains of corn, and covered them in the ſame earth again; the next day I looked on the blades, and found the pearly drops of water ſettled on the blades as before; but on the tops of thoſe blades, whoſe fibrous roots I had cut off, not the leaſt moiſture appeared, though the blades continued in a good verdure through the moiſture of the earth they were put in; this ſhews plainly, thoſe watery globules are not collected from the moiſture of the outward air, but from the juices drawn upwards from the roots. I again wiped off the ſaid drops, and within three hours after found the tops of the blades were ſupplied with freſh drops, which trickle down the ſtalks when they ſwell to ſuch a bulk as to break, and again ſoon renew themſelves. This experiment was made in a mild-time in December. From hence it appears that moiſture muſt hold proportion to the roots; and it gave me farther occaſion of admiring the wiſdom of God in this appointment; for obſerving that theſe exſudations are, as ſoon as the ſharp-pointed blade appears, continually ſent forth, we may ground our judgment on reaſon and probability, that this moiſture immediately begins to diſcharge itſelf, as ſoon as the ſpear is ſhot thro' the end of the barley-corn, which ſoftens the earth upwards, as the blade puſhes forwards, and facilitates the eaſy paſſage of the ſpear: I conjecture it is the ſame in all the graſſy ſharp-pointed plants for the ſame reaſon. The roots of corn and beans alſo terminate in a ſharp point, as they tend downwards, and, ſeeing it is ſo in the ſpires which aſcend, I do very preſumptively ſuſpect, that there is a continual exſudation of a moiſt liquor from the points of the roots, to moiſten and ſoften the earth before them, the more to facilitate the roots penetrating downwards, as it helps the blade to puſh upwards.

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[f] See our author's obſervations on Graſſes.

A cold ſoil will not ripen corn ſo as to make it fit for ſeed. Experiment in barley.

§. 107. Tho' this laſt ſummer (anno 1711) was a dry ſummer, yet it was not a hot ſummer by any means: I malted barley in November which had taken no wet in harveſting, and was ſeemingly very dry and hard: I wondered to find in every handfull I took in the malt-floor at leaſt one hundred grains that did not come: I ſtayed till it came round to the kiln, and then took twenty of the grains which did not ſprout with root, and put them the third of November into a flower-pot with very good mold, and ſet the pot in my ſtudy. Mr. Raymond came to ſee me, and, he being preſent, on the 13th I opened the earth in the pot, and found fourteen barley-corns of the twenty had put forth roots, but had not ſpeared: the other ſix had not in the leaſt made any proffer towards putting forth a root, which I concluded were dead corns. From hence we may eaſily judge how my land, being cold in nature, and coldly ſituated, ripens not barley to perfection but in the hotteſt ſummers, and that this barley, which came not till nine days after it had been taken from the laſt floor, would have proved very coarſe and edge-grown barley, had it been ſown in the field; it alſo ſeems plain from hence, that not only when the barley takes wet in harveſt, and is cold by reaſon of a wet ſummer, but even in all but the very hotteſt ſummers our barley ſhould be ſweated on the kiln in order for malting.

It is now further to be obſerved, that the very ſame barley, out of the ſame field, and of the ſame goodneſs with the twenty grains abovementioned, and which alſo had not taken wet in harveſt, after the floors had been ſeaſoned with drying off two kilns, did ſo far root, that out of a handfull of it, when it had ſo paſt the floors as to be within a week of the kiln, I did not find above thirty grains, which did not ſhew a root. Note, it is to be underſtood, that by drying off two kilns, and carrying the malt through the floors, the floors and houſe had been ſo warmed, which is very ſenſible to the ſmell and feel, that thereby the vegetative powers of the barley were forwarded and more exerted by ſuch heat: this experiment ſtill ſhews how wrong it is to ſow ſuch barley, eſpecially in a cold ground and cold country, to the growing of which warmth is more neceſſary; and tho', as I obſerved, moſt of this barley did come, yet much of it did lie ſo many days backward, that it might be doubted whether it would make above half malt; it is to be believed therefore it might prove, if it came up in cold land, an uſtilago or burnt ear.—From hence I conclude, that wheat, if it handles cold and heavy, will do better the earlier it is ſowed, whilſt the ſeaſon is warm; for if ſowed late, by reaſon of it's own innate coldneſs, it will grow much worſe, and be longer coming up; from hence I alſo conclude, that peas cold or black by reaſon of a wet harveſt, and cold oats, ought by no means to be ſowed in cold land.

Inference that peas alſo and wheat, from a cold ſoil, are not good for ſeed, or muſt be ſowed early.

§. 108. I took nineteen grains of barley out of a heap that paſt the floors of my malt-houſe, and was to be dryed off in a week's time, which made no ſhew of a root, and on the 17th of November I put them into a flower-pot of earth; I obſerved three of them had ſhot blades in five days time above the earth, and on the 27th of November, which was ten days after I had put them in earth, I took them out, and found four more grains were ſpeared under ground, and had not yet appeared, the ſpears being ſhort; and I found the ten remaining grains rooted with four or five roots, but not ſpeared, as yet appearing; but on opening the rind found the ſpears alive, and that they had run near the length of the grain under the rinds: theſe inſtances plainly ſhew the different degrees of virtue in the ſtamina of ſeeds, and how far ſome ſtay behind others, which muſt be of ill conſequence when grain of the moſt perfection is not ſown, eſpecially when ſuch indifferent ſeed is committed to cold ground in a cold clime.

The different degrees of virtue in the ſtamina of ſeeds.

§. 109. In order to make a fuller experiment of this matter, I tried different grains from different ſoils.

February 8th 1711, I put into a flower-pot two hundred grains of black Poland-oats, marked numb. 8.—The ſame day I put into a flower-pot two hundred grains of Eaſton-oats, marked numb. 9.—March 16th both theſe and the Eaſton-oats were come up an inch in ſpear; by the eye I could diſcern no difference in the number of each come up; (they ſeemed to be all come up; viz. two hundred of each) but, on examining with the eye only, it was plainly diſcoverable that the Poland-oat came up with the ſtronger ſpear, and March 27th, after both ſorts of oats had been ſome days in blade and leaf, it was as diſcernable, that the leaf of the Poland-oat was ſomewhat broader than the leaf of the Eaſton-oat, and the ſtem proportionably ſtronger.

A farther experiment to ſhew the neceſſity of ſowing good grain and from a good ſoil.

Continuation of experiments, and cautions concerning ſeed.

February 8th 1711, I put into a pot two hundred grains of barley, being very coarſe, cold, and thin corn, marked numb. 5.—And in another pot two hundred grains of Weſtover barley, marked numb. 6.—And in a third pot two hundred grains of my beſt barley from the down, marked beſt, B. numb. 7.

March 13th there appeared but five of numb. 5, in blade, whereas of the Weſtover and my beſt barley appeared half an inch above ground almoſt all that were ſowed.

March 18th of the worſt barley appeared as near as I could reckon eighty-five blades.—Of Weſtover barley I told above double the number, which being thick I could not eaſily count right, but believe very near the whole two hundred grains were in blade.—Of my beſt barley I believe I might not have by thirty blades ſo many as there were of the Weſtover:—it was alſo manifeſt that many more of the blades of the Weſtover barley, and my beſt barley, had from time to time dew-drops on them than had the blades of the coarſe barley; alſo the drops of the former were larger.—I could alſo eaſily diſcern, if I looked attentively, that the Weſtover barley carried a broader blade than my beſt barley, tho' my beſt barley ſeed ſeemed as full bodied as the Weſtover.

March 27th I opened the three pots of barley, and was ſurprized to ſee how the Weſtover-barley and my beſt had ſtruck roots down to the bottom of the pot, the tap-roots were above eight inches in length and had matted in the bottom, wanting depth to ſtrike deeper; moſt of the roots of the Weſtover barley had ſtruck ſeven, eight, and nine roots; my beſt barley did not ſo often run to ſeven and eight fibres or roots, but more frequent than the Weſtover to five or ſix.—The coarſe barley very rarely run to ſeven or eight, but more commonly to four and five;—and I commonly obſerved ſome of the collateral fibres or roots to be very ſhort.

Concluſion. From all the experiments I have made by ſowing wheat, barley, oats, and peas in flower-pots within doors, I have found that, though the earth was rich and well moiſtened when I firſt put the corn in, yet all the ſaid grains would haſten up to ſpindle with a maiden ſpear, without tillowing; which ſhews that when ground of the field wants either ſtrength, thro' poverty, or convenient air and moiſture, it will do the like, and when corn in the field does ſo, it is a certain ſign of ſome deficiency; for the tillowing of plants proceeds from a redundancy of humours, or a good quick air that agitates them, whereby the maiden ſtock being not ſufficient to receive the vegetable juices, there muſt be an irruption into collateral branches.—I cannot but in a great meaſure impute the aboveſaid defects in the ſeeds I ſowed in the pots in my ſtudy to the want of, and the ſtagnation of the air; becauſe the earth, when I examined it, did not ſeem ſo very arid and exhauſted of juices, but that the plants might have better flouriſhed, conſidering the goodneſs of the mold.—But I believe the collateral branches to be as perfect as the maiden plant in the ſeed; and this vegetation to be no new formation, but an extenſion of parts only.

As the experiments I have made therefore of ſowing corn in pots of earth were within doors, where it ſeems to me, for want of motion of air and a quick ſucceſſion of it, the juices ſtagnate in the plants, and are not puſhed on to tillow, but run to ſpindle, and as by the experiments of malting barley, which in windy weather, when the air is plentifully forced into the bodies of plants, runs out to root and to ſpire in a haſty manner, [s] I doubt not but, when I can make the experiments of ſowing corn (as before within doors) in pots of earth placed out in the air in the month of April, when the earth ſhall be the ſame, the water which waters both ſort of pots be rain, the inlet of the ſoutherly ſun through the glaſs window the ſame poſition, and the warmth within doors rather greater, I ſhall then better diſcover the beneficial powers of air to plants, by comparing the difference; from whence juſt reflections may alſo ariſe of how great conſequence ſalubrious and plentiful hauſtus's of it muſt be to our human bodies.

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[s] Of the great quantity of air contained in vegetables, and it's various uſes, ſee the articles Air and Seed in Mr. Miller's dictionary.—Lettice-ſeed, that was ſown in the glaſs-receiver of the air-pump, which was exhauſted and cleared from all air, grew not at all in eight days time; whereas ſome of the ſame ſeed, that was ſown at the ſame time in the open air, was riſen to the height of an inch and an half in that time; but, the air being let into the empty receiver, the ſeed grew up to the height of two or three inches in the ſpace of one week.—When ſeeds are packed up for exportation, great care ſhould be taken, that they are not ſhut up too cloſely from the air, which is abſolutely neceſſary to maintain the principle of vegetation.

Seeds ſent from abroad in ſealed up bottles would not grow when ſown.

Of vegetation in general.

§. 110. It is a difficult taſk to unfold and aſcertain the complicated principles of vegetation (as they are more or leſs in all ſorts of earth, and as they not only quicken or impregnate the ſeed, but carry it on through all it's gradations, of woody, leafy, flowery, and fruit ſubſtances) ſo as to know how to proportion them, or ſay in what manner and proportion they act and perform their ſeveral offices.

For though experiments have been made of nitre, blood, ſoot, &c. all which have been found great forcers, ſo as to bring forward the leaves and branches of a plant, yet it may be the flowers or fruit, either in bulk or number, may not equally ſucceed by ſuch mangoniſm; few I believe having had the patience to make an exact experiment throughout the aforeſaid courſes of vegetation, or if they have, they may not have rightly conſidered what other mixtures there are in the earth wherewith theſe menſtruums may co-operate.

To make a juſt experiment of this kind, I conceive the naturaliſt ought to take earth very much emaciated by hard ploughing (if it were reduced to a caput mortuum it would be much the better) and to lay ſome loads of it in different heaps apart, and to impregnate each heap with a different and moſt ſimple manure, and by equal meaſure, and then to plant it with the ſame ſeeds; it would be alſo proper that one heap of this earth ſhould be left in it's natural ſtrength, and ſeed ſowed in it, to ſee the difference.

I ſhould alſo propoſe that many parcels of the ſame earth were taken out of a corner where the plough cannot come to ſtir it up and impoveriſh it, and that the ſame experiments were repeated, and a trial made as before what a parcel of this earth could do by it's own virtue;

Alſo, that in the like parcels of earth different mixtures were made and blended together of the ſaid menſtruums, in order to ſee the ſucceſs of ſuch compoſitions;

And when all this is done, if I may be allowed to anticipate the event, I may venture to pronounce the project will be in a great meaſure fruitleſs; for though by this means may be in a great meaſure diſcovered what are ſpurs to nature, and what will produce the deſired increaſe, yet to transfer ſuch diſcoveries into the courſe of huſbandry will be impracticable, by reaſon of the expence,

Seeds being hung up a year in bags, and others from the ſame parcel being kept a year in bottles ſealed hermetically, the former when ſown grew well, but none of the latter came up.

expence, nor will it explain and diſcover the principles of vegetation, as to the cauſe, ſo as to make a perſon the wiſer, though we know whereby to give the production; becauſe I conceive theſe menſtruums taking in with them the latent and concurrent powers and virtues of the air, earth, water, ſun, and temperament of ſoil with which they are blended and digeſted, make a certain union and texture ſo incorporated and interwoven, that they are not eaſily ſeparable (unleſs by fire) from whence reſults a third principle, or quinta eſſentia, which performs theſe mighty wonders of nature; ſo that from theſe happy mixtures does ariſe a ſpecifick which God wills ſhall do, and therefore does theſe great things.

Wherefore by experience we ſay of principles in vegetation with phyſicians in medicaments, that, as ſuch and ſuch ſimples are of themſelves profitable towards curing particular diſtempers, ſo when taken in compoſition (as Sydenham profeſſes) their efficacy is much greater.

This vegetable balſam, tho' ſo difficult to ſay wherein it conſiſts, yet it may be averred, is as eaſily to be ſeen as underſtood; for tho' almoſt as ſubtil as a phantom, yet it's marks are eaſily diſcovered to the diligent huſbandman converſant about arable land: we can eaſily perceive by the different colour of our land (as it turns up under the plough) whether it has born one, two, three, or four crops, and how in proportion the virtue is gone out of it; and as ſenſible we are by it's reſt, and lying to paſture, how with it's vigour it renews alſo it's colour; we do not better ſee and know when the plumb or grape is covered with or has loſt it's bloomy blue, than we know by the colour the fertility of our ſoil, which colour ariſes from the principles before intimated, of dung, air, fire, earth, &c. mingled together, which by often ſowing are abſorbed into the corn in too liberal a manner to be renewed by a daily recruit from thoſe elements.

Cauſe of good land's ſoon recovering it's ſtrength, and bad land not doing it.

§. 111. There is one thing not eaſily reconcileable, and which may well afford matter of ſpeculation to the curious, which is, that very good earth, tho' exhauſted never ſo much with ploughing (ſo that it will not bear a crop of corn) yet will in a few years recover by reſt; whereas land poor by nature, and yet capable of bearing as good a crop as the land good by nature, when it's ſtrength was at loweſt by being over-wrought by the plough, ſhall make but a very ordinary improvement in proportion to the other land, and never exceed a certain fecundity, which is it's ne plus ultra; and yet both theſe ſoils equally exhauſted one would think ſtarted fairly together, and ſtood on equal terms and advantage of imbibing the aforeſaid elements, and theſe are all the materials and talents they have to improve from.—I am at a loſs what ſolution or tolerable account can be given of this phænomenon, unleſs I ſay, the earth, which was good by nature, conſiſting of a juſt and happy texture of parts, fitted by a due continuity and unity to receive the aforeſaid elements, and yet not ſo cloſe as to retain and impriſon the watery and firey parts till they putrify and corrupt, but till by a kind fermentation the ſpirituous parts are converted into fixed ſalts, do then let through, and ſuffer the fæces to be waſhed away, or to be purified by the continual free acceſs of the elements; whereas, on the contrary, the abovementioned poor land, either by too ſtrict a bond of union, (as clays, before they are friable by art) are too compact and conſolidated to admit the benign influences of the elements, or elſe they retain and impriſon the immiſſions, till, for want of ventilation and circulation, the ſtagnating juices grow ſour and acid, and, by reaſon of the coldneſs of the earth they are ſhut up in, are not capable of a ſufficient fermentation to be converted into fixed vegetable ſalts.

The other ſort of poor land, which being once impoveriſhed is a long time before it recovers, runs into a contrary extream, viz. that of too looſe and light a mold, which may be compared to a perſon under a dyſentery, who has no retentive faculty; through this the nouriſhment paſſes with that precipitation as not to abide long enough to receive a fermentation; but the ſpirits, and all the fat ſubſtance received is waſhed away and carried downwards undigeſted, and ſo ſuch ground can receive but ſlow recruits from the elements.

Or ſhall we ſay, the recruit good land receives, after it is impoveriſhed, ſeems in a good meaſure to ariſe from the effluvia of the layers or beds of earth, many feet deep, which are exhaled into the upper ſurface, and by the heat of the ſun converted into fixed ſalts; for generally the better and richer the upper coat of the ſoil is, the lower veins of earth are in ſome proportion anſwerable and correſpondent thereto.

ROLLING.

§. 1. I Cannot find, as I obſerved before, by any of the Roman writers, that they uſed a roller in their huſbandry, but only a crates, that is, a hurdle or flat timber, to draw over their corn, to level the ground. See Columella, lib. 2. cap. 18.

No roller among the antients.

§. 2. In Spain, after their ſummer-corn is ſown, a horſe draws a broad board of about ten foot long, a boy ſtanding on the board, and driving over the corn, which ſerves inſtead of a roller.

The Spaniſh inſtrument like the antient crates.

Whereas above, the long plank is deſcribed to be drawn as a roller, Lord Pembroke rectified my notion, and told me, that the plank is drawn at length after the horſe, as he has ſeen it; for, ſaid he, otherwiſe a horſe could not draw it, and this way there is an equal weight on the earth for the ſpace the board covers, as there is on the breadth of earth covered by a roller, whereas, had the plank covered the earth, and been drawn the ſame way as a roller, it would be too light to ſignify any thing.

§. 3. Treading wheat, after it is ſowed, by folding ſheep on it, is allowed to make it cloſer than rolling it, in regard rolling only lays the ridge of the furrow flat, but the ſheep's feet find every little hollow place, and tread it cloſe.

Treading wheat with ſheep.

In Leiceſter-ſhire.

I aſked Mr. Edwards whether the farmers in Leiceſterſhire rolled both barley and oats; he ſaid, yes, they always did, and wheat too, except they folded it, but he never knew them roll peas.—I aſked him why they rolled not the wheat they folded; he ſaid, becauſe that needed it not, for the fold trod it harder than a roller could preſs it, for which reaſon they endeavour, as much as they can, to fold on the light land. He ſaid a roller could not be too heavy, tho' it was as much as five horſes could draw; that the land by good rolling, if there wanted rain, bore the hot weather much the better; the roller alſo broke the clods, and made way for the corn to come up through them.

Caution to roll with horſes on breaſt.

§. 4. If corn be come up, and then rolled with a very heavy roller, the five or ſix horſes that draw it, going all in a line, and treading in each other's ſteps, often bruiſe and hurt the corn very much, for which reaſon it is adviſeable to draw ſuch a roller with horſes on breaſt, ſide by ſide.

Heavy rollers in Hants.

§. 5. They are forced to make uſe of very heavy rollers in our hill-country to roll over the flints among the barley and oats, otherwiſe there would be no mowing them; they often uſe them likewiſe in March to preſs the ground ſomewhat cloſer to the corn.

Two lighter rollers rather commended than one heavy one.

§. 6. Major Liver ſays, he rather approves of two rollers, that may be drawn by three horſes apiece, than one heavy one that requires ſix; for, ſaid he, the light ones make double the diſpatch; beſides, if the great roller be uſed in clover-graſs it will be apt to bruiſe the bulbous root too much, and if uſed on corn-ground, tho' never ſo dry, (whereon it will do moſt good) the horſes will break it up ſo much with their heels in ſtraining, that it will not be healed again by the roller's coming over it.

As it is of great conſequence in the hill-country, at ſeed-time, in dry ſeaſons, to break in the earth after the ſown corn, the ſame day it is ſown, with a couple of harrows, ſo I think it is of as great conſequence that a roller, or a couple of a ſmall ſize, ſuch as one horſe, or two at moſt may draw, be kept in readineſs, to ſettle the mellow and hollow earth cloſe to the roots of the corn, without compreſſing it too cloſe; for tho' corn loves to lie eaſy, it loves alſo that the earth ſhould lie cloſe about it, that it may go immediately on it's work of ſhooting forth it's roots to the beſt advantage. If the ground works any ways dry, or in powder, this will be found to be the beſt way in the hill-country, to prevent the ſun's penetrating too deep by reaſon of the dry and light mold,—and then, after the corn is well come up, the great roller may go over it as uſual.

Of rollers with nails in them.

§. 7. My bailiff ſaid, he had ſeen rollers, on which nails had been drove as thick as it could hold to ſave it from cracking, and from wearing with the ſtones;—but I think ſuch a roller could not do well to roll ſtony land, when the corn is come up, becauſe the nails would be apt to cut off the corn.

Rolling ſaves ſeed, a leſs quantity will do.

§. 8. In converſation with ſeveral farmers on the ſubject of rolling, and in ſpeaking in commendation of rolling after the corn was ſowed, they ſaid, that half a buſhel of oats might be ſaved in ſowing an acre by ſecuring the earth, and laying it cloſe to the corn; if a raſcally team, ſaid they, were bought for that purpoſe, and ſold off again, it would pay the purchaſe of the horſes.

§. 9. I believe that a * wood-ſeer ground ſhould have the great roller, if it be never ſo big, go twice or three times or oftener over it, after it is ſowed to ſummer-corn, and after rains, to conſolidate, if poſſible, an iron-mold-ground, conſiſting of coarſe harſh disjointed particles; for both cold and heat penetrate it, and, by changes, make the corn die to the root, but at length, getting more ſtrength by this compreſſion, the root may be enabled to live, and maintain it's blade.

* Loamy, ferny, looſe.

A heavy roller for wood-ſeer ground.

§. 10. In harrowing after ſowing, it ſhould chiefly be conſidered how ſmooth and fine your ground lies, in order to ſettle, and, if any of your ground lies rough and knobby hard, it ſeems that the ſmooth looſe land ſhould be firſt rolled, and the rough knobby land be deferred in hopes of a ſhower of rain to mellow and looſen it, not only becauſe the knobs will then break, but alſo becauſe their being ſo hard may bruiſe and cut off the tender blades of corn.

What ſort of ground to be firſt rolled after ſowing.

§. 11. Rolling as ſoon as poſſible after ſowing ſummer-corn will in a great meaſure prevent edge-growing, in caſe of a dry ſeaſon; for the lower corn laying moiſteſt, would, unleſs rolled, come up long before the other; but that which lies ſhallower, the cruſt of the earth being ſcorched, could not get away without a good ſhower, and perhaps be malted firſt, whereas rolling ſoon, if it be dry, brings it all up together.

Rolling ſoon after ſowing prevents edge-growing.

§. 12. When the ground is wet, or after a little rain fallen, it is not proper to roll, becauſe the earth will cling and gather to the roller; and alſo when land is wet, rolling after ſowing may be ill huſbandry, becauſe it keeps the moiſture ſo much in the ground, eſpecially if early in the ſpring, that thereby the corn will be chilled.

Not to roll wet ground after ſowing.

§. 13. If corn be well come up, and wet fall, it is generally proper to roll the laſt ſowed firſt, becauſe ſuch corn has leſs dew, and the earth dries faſteſt.

What corn to roll firſt when come up.

§. 14. They ſeldom roll their wheat about Holt in Wiltſhire, and obſerving the ſurface of the wheat-ground to lie very hollow and dry, and one's feet to ſink deep into it, it being in March, I wondered at it, and ſpoke to Mr. Randolph about it.—He ſaid, in their country they ſeldom found their wheat ſuffer for want of rolling, becauſe they ploughed round furrows, and laid their corn in deep:—on which he and I went into Mr. Byſſy's wheat, and I found, tho' it was hollow, yet the corn lay about four inches deep, and from thence took root downwards; however we both thought rolling would not do amiſs.

Why they roll not their wheat about Holt in Wilts.

§. 15. Mr. Carter of Colehenley and Mr. Longman aſſure me, that they have rolled their wheat ſoon after ſown when they can get a ſeaſon for it, and it has always been much the better for it; and farther, that wheat ſo rolled has this advantage, that there is generally more leiſure for rolling ſoon

Of rolling wheat ſoon after ſowing.

after ſowing wheat than after ſpring-corn, and it cloſes the ground to the roots, and prevents the winter-cold from penetrating, nor can the worms ſo eaſily turn up the earth from the roots of the corn; and by experience it has been found, that ſuch grounds bear the high winds the better for being ſmooth; for the wheat itſelf breaks the wind, and each blade ſhelters the other, and more eſpecially ſo the lighter the ground was before rolling, juſt as a drab-coat is warmer to us than a ſpungier cloth of the ſame thickneſs; and, when the March-winds blow, the earth of ſuch rolled ground is not ſo eaſily carried away from the roots of the corn as that of rougher ground is. Mr. Carter ſays, about Baſingſtoke they always roll in the ſame manner.

At a meeting of ſeveral good farmers I diſcourſed with them on the ſubject of rolling wheat ſoon after it is ſowed, and ſaid, I could not ſee any inconveniency in it, but that it muſt be good huſbandry; for I could not apprehend how by laying the land flat the wheat ſhould lie the colder, or, if it did, what ſignified the blade being taken off by the winter cold ſo long as the root was well fortified by the earth's lying cloſe to it; yet I ſhould not always approve of rolling till I ſaw the approach of winter, leſt by rolling too ſoon after ſowing, eſpecially if the beginning of winter proved mild, it might bring the wheat away too faſt, and make it rank. To this they all aſſented.

Of rolling, in the ſpring and after a hard winter, wheat that was ſowed late and wet.

§. 16. The autumn anno 1715 was ſo very wet, the country people could not ſow their full crop of wheat, and, whereas I intended to have ſown one hundred and ſixty acres, I could ſow but one hundred and twenty,—and one third part of that I could not get into the ground till between the 10th and 20th of October. The winter proved extream cold and ſnowy, and the ſnow lay deep and long on the ground: the wheat of the country in general, as well as mine, was pinched by the cold, and ſtopt in the ground during the whole winter, eſpecially the latter ſown, and in the ſpring, when the ſnow went off, from the end of January to April we had no rain, but drying churliſh cold winds with froſts; ſo that towards the end of March the wheat was very poor and weak, inſomuch that a traveller could hardly take it to be wheat.—Being ſenſible the ground muſt lie hollow from the roots of the wheat through ſuch extream froſts, and alſo want moiſture by reaſon of ſuch dry winds and want of rain, I rolled my wheat at a time I could ill ſpare my horſes from ſowing ſpring-corn, but it was wonderful how much it began immediately to thrive after ſuch compreſſure of the earth to the roots of the corn, and how much it contributed to the colour, which was viſible in a day or two after rolling, and it continued to improve proportionably, tho' the cold winds and drought ſtill continued.

If wheat turns yellow, or looks unhealthy in winter-time by wet, it is to no purpoſe to ſay, the ground will lie too ſmooth and cold, if ſmoothed by rolling; the preſent diſtemper is to be conſulted, and the ground, as ſoon as dry enough, ought to be rolled.

Beſt ſeaſon of rolling wheat in the ſpring.

§. 17. As wheat ſhould not be rolled too early in the ſpring, leſt the froſts ſhould hollow it again, ſo it ought to be done ſoon enough to give it the advantage of tillowing; for doubtleſs the ſinking the roots of the wheat deeper into the earth by rolling, and the cloſing the earth to the mores and knees of the winter or autumn-tillows makes them tillow afreſh, and if rolled by about the eighth or middle of March, that will, as I ſuppoſe, be the beſt ſeaſon for rolling in the ſpring; nevertheleſs wheat may be in that unthriving condition, that it may be neceſſary to roll it ſooner.

Of rolling barley.

§. 18. The firſt week in May (anno 1703) I ſowed rath-ripe barley, and on the firſt of June I ſaw the barley falling off, and declining; the ground was very hollow, and as I thought needed rolling again; ſo I ordered it to be rolled where it was lighteſt, as on the head-lands, &c.—The barley had a good ſtem, and in going up the hill, the horſes being forced to ſtrain on their hoof's points in many places actually cut off the barley at the ſtem, inſomuch that I could in ſome places take up handfuls; but examining it, and opening the valves, I found nothing but leaves rolled together, and that the ear of the barley was ſeated lower, and not yet ſhot above ground; however I ſtaked down a ſtick or two in the places that ſuffered moſt, to ſee how the ears there proved.—In the evening of the next day walking in the ground I obſerved the barley to look much refreſhed, and to be greatly improved in colour, which ſeemed ſtrange in ſo ſhort a time; but what wonder if a plant revives in twenty-four hours when, being gathered, it languiſhes in one. The conſiderable benefit it received was by compreſſing the ground, which by it's ſpungineſs had taken a great deal of wet, but the roller, by compreſſing it, ſqueezed it from the roots of the corn.—The corn I had marked with ſticks came up well alſo, and carried as good ears as the other.

Of rolling oats.

§. 19. Oats early ſowed, if not rolled till towards the end of or after ſeed-time, ought, for the moſt part, to be rolled with the heavieſt roller, for a light one will make but a ſmall impreſſion where the ground has been ſo long ſettled.

Rolling checks weeds. Of rolling peas.

§. 20. I obſerved the great grey partridge-peas ſowed in February had very little charlock among them, tho' not rolled: it ſeems to me the ground ploughing heavier then, than it did in March, and the coldneſs of the ſeaſon obſtructed the germination of the charlock-ſeed, and by that time the ſpring came the ground was pretty well ſettled, and become too cloſe and hard for much of the charlock-ſeed to puſh through;—but the blue peas ſowed in March had abundance of charlock amongſt them, eſpecially where the ground had been dry and worked fine, to the prejudice of the peas, theſe peas not having been rolled neither; wherefore I conceive, that rolling of peas as ſoon as the ground is ſown, or ſoon after, would bind and preſs it ſo cloſe, as to prevent the charlock-ſeed from coming up, and I do therefore hold rolling to be good to prevent the growth of this, and many other ſorts of weeds.—And barley and oats, which with us are rolled, do doubtleſs thereby much more eſcape being infeſted with weeds:—but, as the coldneſs of the ground in February, and the moiſture is a check to the growth of charlock, (for all moiſture at that ſeaſon is cold) ſo moiſture and wet after the middle of March, and in April, is productive of charlock and other weeds, becauſe ſuch moiſture is then tolerable warm by the power of the ſun acting on it.

Of rolling vetches.

§. 21. To roll winter-vetches when firſt ſowed ſeems to me to be as proper as to roll wheat when firſt ſowed; as before noted.

Of rolling clover.

§. 22. In light land, where clover is ſowed, if in the winter-time the great roller was drawn over it, it would faſten the ground, and make the clover hold much better and longer.

Of CORN in GENERAL.

Opinion of the antients concerning corn's degenerating.

§. 1.[a] COlumella tells us, that, except we take care to change the ſeed, corn will degenerate much ſooner in a wet ſoil than a dry one, and, after a third crop, wheat will become what he calls a ſiligo, a ſort of corn fair in colour, but poor in ſubſtance. Palladius ſpeaks to the ſame purpoſe.

Of many ears on one ſtalk.

§. 2. Evelyn, as before hinted, reports that diverſe ears may grow on one ſtalk, which is what I have never obſerved, except in Pharaoh's dream, (Gen. xli. 5.) where we read of ſeven ears of corn that came upon one ſtalk.

* ſtem or ſtalk is ſuppoſed to be meant, or elſe there is nothing remarkable in it.

Heylin, lib. 2. fo. 133,—ſays, in Rezan, a great and goodly province in Ruſſia, ſituated between the river Tanais and the river Occa, the moſt fruitful country of all Ruſſia, and (if report be true) of the whole world, it is credibly affirmed, that one * grain of corn brings forth ſix ears, the ſtalks whereof are ſo thick that a horſe may paſs through, or a quail fly out of one of them, but with very much difficulty. This author alſo gives inſtances of the vaſt fruitfulneſs of Padolia in Poland, fo. 144.

Mr. Bobart of the Phyſick-garden at Oxford told me, he had in his herbal a barley-culm with three fair ears thereon, but the two outermoſt were ſhorter than the other; he inſcribed or under-wrote this plant

Thus;— Hordeum ſpica multiplici,
Found plentifully growing near
Sutton by Cranborn in Dorſetſhire,
By Mr. Crop of Chriſt's-church-college, an. 1697.

Concerning the above field of corn Mr. Bobart ſaid, the ſtory was, that charitable woman in time of great ſcarcity had relieved the poor, and God gave this return.—The ſame day I ſaw doctor Frampton of the abovesaid county, who told me, he had never ſeen the field, nor any ſuch ears of corn; but had heard of the thing, and the ſtory.—However I give not much credit either to the fact, or the cauſe.—Mr. Bobart alſo aſſured me, he had once ſeen a wheat-ſtalk with two ears on it. Some time after this I ſent him a ſpike or an ear of ſmooth-creſted-graſs, which divided itſelf in this manner Y, ſo that there were two compleat ears nearly on one ſtalk. Refer this to Mr. Evelyn's prodigy of wheat.

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[a] Celerius locis humidis quam ſiccis frumenta degenerant, niſi cura adhibeatur renovare ſemen. Columella, lib. 8 f. 102.—Nam omne triticum ſolo uliginoſo poſt tertiam ſationem convertitur in ſiliginem, Columella, lib. 8. fo. 102.—Locis humidis ſemina citius quam ſiccis degenerant. Palladius, lib. 1. ſect. 6.—Et infra dicit, omne triticum in ſolo uliginoſo, poſt tertiam ſationem in genus ſiliginis commutatur.

Of barley bringing grain of a different ſpecies.

§. 3. Mr. Ray, in his Prolegomenon to his firſt volume of plants, quotes the opinions of ſeveral authors, that barley ears have here and there carried grains of oats, and other grains of different corn from it's ſpecies; but they, who made ſuch obſervation, it ſeems, were bookiſh men, who were miſled by the appearance to their eyes, and unacquainted with what is commonly obſerved in huſbandry; it being true, that, in wet years, when barley runs thin, it is common for a grain, here and there in a barley ear, to have a deep creſe along it, and to be as thin as an oat, and to reſemble an oat very much, but in truth, if unrinded, has no oat-hull, but a barley rind on it; and doubtleſs, in caſe ſuch oat they pretend to grow on the barley ear was ſowed, it would produce a true barley ear.

Benefit of great dews in hot countries.

§. 4. In the hot countries, where little rain falls, the dews fall in vaſt quantities, on which the herb of the field has great dependance for being watered; this was reckoned in thoſe parts amongſt the greateſt bleſſings in the gift of the Almighty, and ſo Iſaac bleſſes Jacob (Gen. xxvii. 28 and 39) God give thee of the dew of heaven, and

Mr. Garret who lived many years at Madrid aſſures me, their crops of corn in Spain are much thicker ſet than ours, and yet their ground is very light, at which I wondered, their country being hot.—He replied, they ſowed very early, before the ſun grew hot, and that the dews were very great.

Late ſowed corn will not ſeed well after dry ſprings, in the hill-country.

§. 5. This year (1707) the ſpring proving very dry till June 13th convinced me, that not only peas, but all ſorts of corn alſo late ſowed for ſeed will not ſeed well; for in our hill-country the oats and barley, &c. tho' ſowed early, yet not growing till the aboveſaid rain fell, had all ſhort ears; the ſort of land could not bring on the corn faſt enough, tho' the ſummer all-along afterwards had plenty of rain.—In very rich lands, it is likely this year the ſame defect was not obſerved.

Wheat will not tillow well in wet cold ſprings.

§. 6. It ſeems to me, and was apparent this cold wet ſpring (1708) that, if the month of April be wet and cold, the wheat will not tillow, or multiply it's iſſues, but the winter-ſpindle or ſhoot will run up; for that winter-ſtalk being hardened will keep growing, whereas, to form collateral buds, which are tender, warmer weather is required, not too quick growing weather by means of hot gloomy rains, but mild and mellow weather; for, when the fluſh of ſap is impetuous by gloomy heat, it riſes ſo faſt upwards into the firſt maiden-ſtalk, that in it's hurry it ſtops not enough to fling out ſide-branches; as in the ſmall pox, if in the firſt ſymptoms the patient's blood be high inflamed and feveriſh, it hurries the morbific matter ſo furiouſly along the veins, that (unleſs by bleeding it be qualified) it is ſo carried on in a torrent as not to have leiſure to kick out the puſtles and the diſtemper; ſo then a hot wet ſeaſon or a cold wet one are both unkindly for great crops of corn.

No country too hot where the land is fertile.

§. 7. The great fertility of Ægypt ſhews no country can be too hot where the land is very fertile; for our clays and mixed earths, that want the impregnating heat of the ſun, are often burnt up; but their lands are ſo rich, that if there is but the leaſt moiſture at the bottom of the ſull, when they ſow, their corn will be brought up in twenty-four hours time by vertue of that moiſture, before it can be dried up, at which inſtant it ſtrikes it's roots into the moiſter earth, as before mentioned in corn ſown in ſand;—whereas in our country, where corn requires a week or ten days time to ſtrike root in, the moiſture may be dried up before the grain can be impregnated, and ſo, if rain comes not, it often lies two, three, or four months without ſtriking root, as it did this dry ſummer anno 1705—and began but to grow juſt before harveſt. If corn once grows, we ſee it is not eaſily checked by drought in good land: in the hot countries they have great dews.

Winter-corn bears drought better than ſpring-corn.

§. 8. By the effects of this very dry ſpring and hot ſummer (anno 1714) from March to July the 23d, when we had a day's rain that went to the roots of the corn, I am ſenſible that winter-corn, as wheat and vetches, do bear up much better againſt the miſchiefs by drought than the ſpring-corn, as peas, barley, and oats, the former being well eſtabliſhed at the roots, during the winter, and the ground better ſettled to them.

May, a critical time for the lenten crop in the north of England.

§. 9. Being in the north (anno 1706) I had a mind more thoroughly to be informed what was moſt prejudicial to their lenten crop; ſo I aſked an excellent huſbandman in Leiceſterſhire when rain fell moſt unſeaſonably on their ſummer-corn; he ſaid, in May; if it proved a wet May they had always a bad crop of barley; for rain then, either killed it, or ſtarved it, and made it look yellow.—I aſked him what reaſon he could give for it; he ſaid, about the beginning of May was commonly the time that their barley took it's weaning, that is, ſaid he, when the leaves of the barley begin to die, having till that time been for the moſt part nouriſhed by the milk and flour of the corn; but then it begins to put forth new roots, and new leaves, and to betake itſelf wholly to it's roots for nouriſhment: though the weather ſhould prove never ſo good, at this criſis it receives a ſtop and check, like a child taken from nurſe, with whom it goes much harder if the nights are cold and long; ſo, if wet and rainy weather comes then, the barley will be ſo daſhed, that it will never recover it, let what warm weather ſoever come after; for, ſaid he, after ſuch rains, the ſun having baked the top of the ground does thereby ſo bind it, that the heat cannot penetrate to the roots of the corn, which by that means lie all the ſummer in a cold bed;—but a cold and dry May, ſaid he, I never knew to hurt us, but rather do us good:--according as the ſpring proves forwarder or backwarder, ſo does this criſis of the corn's taking it's weaning come earlier or later, but generally about the beginning of May, unleſs the ſpring be very warm; but a wet May uſed not to hurt their wheat, excepting that it made it weedy; for, ſaid he, if we have a good ſeaſon to ſow our wheat in, that ſeldom miſſes.—Mr. Clerk ſaid afterwards, their having a ſeaſon to lay their barley into the ground dry, and having a dry bottom the depth of the ſull, for it to take root in, was of great conſequence towards a good crop.

Corn does not ſpindle well in hot countries.

§. 10. Lord Bacon in his Natural hiſtory ſays, that in the hot countries it is a frequent calamity, that the corn will not ſpindle, that is, will not come out of the hoſe, by reaſon of the great heat and drought; and he is of opinion, that on this account the latin word *calamitas* was derived from *calamus*.—But I rather believe it alſo ſignifies any other misfortune belonging to corn. Pliny and Columella, ſpeaking of blights and ſmuts, ſay, Hordeum omnium granorum minime calamitoſum;—but not ſpindling is a defect we ſeldom find in England.

Cold land and wet years occaſion coarſe weak ſtraw.

§. 11. From conſtant experience of ſucceſſive years I find, that cold wet years make the ſtraw of all corn weak, ſmall, and thin, inſomuch that it is apt to lodge and crumble down, which in the country we call being knee-bent; on the other hand in dry hot ſummers all ſtraw is thick and ſtrong.—The ſtraw in wet years runs the coarſer, and that in dry hot years the finer, and then it has the more ſpirit in it; which is the reaſon why in hotter countries than England the cattle eat ſtraw ſo much better than with us, and almoſt as well as hay.—As cold wet ſeaſons make the ſtraw run coarſe, ſo cold wet land has the ſame effect; therefore, when both theſe cauſes concur and contribute their force, the ſtraw will run very weak, thin, and coarſe; as particularly, this year (1717) the rath-ripe barley did at Crux-Eaſton, where the land is cold and wet, as was the year,—and rain more than uſual falling on the barley, about a month before harveſt, lent a helping hand to the beating it down; ſo that the barley-ſtraw in a manner broke off a little below the ear, and before the grain was full plimmed or hardened, from which time all communication of nouriſhment ſtopt, and the corn rather ſhrank in than ripened, and conſequently the barley as well as the ſtraw in our cold lands ran very thin and coarſe.—However I eſteem it beſt on our cold lands to ſow one half of the crop rath-ripe barley, becauſe, though in ſuch a cold year it might ſuffer as aboveſaid in cold wet lands, yet, had it not been for the rain that fell, and the winds that beat and broke it down at that nick of time, before it was hardened, it would have carried a better body than the late-ripe barley, in the ſame caſe, and on the ſame ſort of land, would have done.—The uſe to be made of all this is, that tho' there is no preventing this evil, yet knowing beforehand that in ſuch a year your fodder-ſtraw will be coarſe, you muſt therefore apply it to proper uſes, elſe it will deceive you.

The colour of corn denotes it's quality, and why.

§. 12. The colour of corn, viz. of wheat and barley, gives a great preference with the huſbandman in a market, which does not a little puzzle the inquiſitive gentleman, a ſtranger to huſbandry, who hears it; but the reaſon for it is this; there is an uniformity between the colour of corn and it's weight, and the latter never fails to be accompanied with the former quality;——which therefore denotes its goodneſs. Wheat weighs light, becauſe it has not come to it's full maturity, and ſo has not ſufficiently diſcharged the watery parts, which proceed chiefly from the coldneſs of the ground, that wanted ſpirit to carry the grain to a full perfection of ripeneſs; and the defect of colour may be occaſioned by too much rain, which ſogged the grain in harveſt, whilſt ſtanding, or in gripp; for being often wet and dried again, every time it was dried, after being wet and full ripe, the moiſture exhaled by the ſun's drying it carried alſo away a tincture of, or the particles of it's colour along with the exhalation of the watery parts, and ſo conſequently the grain muſt be more porous, leſs ſolid, and of courſe lighter: the ſame argument will hold for barley.

All corn is apt to grow brighter as it grows towards earing, but that, which then moſt holds the deep green colour, is likelieſt afterwards to have the largeſt and boldeſt ears, and to bring the grain beſt to perfection.

Damage to green corn by dry weather near earing time.

§. 13. It was a very dry burning time (anno 1702) from the firſt ſowing of lenten corn to the 3d of June, at which time ſome of my neighbouring farmers were praying for rain: why, ſaid I, you muſt be in a better condition than I am; I have not ſeen your corn, but I know your's was ſown ten days before mine, and conſequently muſt better cover the ground, and keep it cool. That might be, ſaid they, but in another reſpect, becauſe our's was ſowed earlieſt, it may be the worſe; in about a fortnight our's will be at the time for getting out of the hood, which it will not be able to do except rain come.

Of the bloſſom.

§. 14. I obſerve the white ſtraw-wheat brings white bloſſoms, as the red ſtraw-wheat does red ones, and I ſuppoſe it is the ſame with the white oat.

Prejudice from rain at blooming time, and why.

§. 15. The latin writers De re agraria obſerve, that rainy weather prejudices all ſorts of corn at the blooming-time, except the leguminous ſort; the reaſon of which, as I ſuppoſe, is, becauſe the wet falls into the huſk of wheat, barley, and oats, which at that time opens, and ſo is corrupted by the wet ſtanding on it, whereas in the leguminous grain the pod lies within the leafy flower, into which the wet cannot enter.

Sign of good corn when growing.

§. 16. The whiter wheat, barley, and white oats, or the hoods of black oats look as they ripen, and when they are ripe, the better the corn; and the contrary, the coarſer, or more blighted.

The diſadvantage that late ripe corn lies under.

§. 17. The diſadvantage that late ripe corn lies under in point of coarſeneſs may be collected from the late ripe nuts hanging on the trees, in the beginning of September, or at leaſt at Michaelmaſs, eſpecially, if rain ſhould fall about that time, for notwithſtanding the kirnel of the nut is ſecured by a ſhell, yet, at that ſeaſon of the year, the cold damp air, the dews, and the rain penetrate the ſhells of nuts, whereby the kirnels change their colour, become wateriſh, and in a manner taſteleſs; and doubtleſs the ſame evil falls on the late ripe corn.

Of froſt's ripening corn.

§. 18. When September is come, ſay our hill-country farmers, there are froſty nights, and then the corn ripens as faſt by night as by day: they always found it ſo at Eaſton.

But, notwithſtanding this obſervation, with which our farmers comfort themſelves, that in the froſty nights, at the beginning of September, the corn ripens as faſt by night as by day, yet willingly I would not have corn to be ſo ripened, for in truth ſuch ripening may be more properly called blighting;

inaſmuch as ripening implies filling the grain, and ſomewhat leading to it's perfection; but theſe froſty nights rather ſhrink, and dry up the grain, and ſtop it's filling and plimming: in like manner all ſorts of fruit may be ſaid to be ripened by the froſts, inaſmuch as they precipitate to a rottenneſs, &c. And my opinion is, that ſuch blighted or froſt-bitten barley, not arrived to it's natural ripeneſs, can never have a goodneſs in it's flour like other corn that is ripened thoroughly, nor be ſo profitable for malting; it may poſſibly be as big as kindly ripened corn.

§. 19. If harveſt proves late, as in the latter end of Auguſt, wheat and barley, that is then to fill, muſt run thin, and the ſame is true of all ſorts of grain, and in a wet ſummer the vale-corn, which uſually runs to halm, will keep the ground cold, and prevent the filling of the grains.

Wheat and barley thin in a late harveſt.

§. 20. A late harveſt is ſeldom, as I believe, a hurrying harveſt; becauſe, though in ſuch caſe there is reaſon to make all haſte poſſible, yet the coolneſs of the days, and the long dewy nights will not let the corn ripen altogether, nor make it ſhed or britt, as the early harveſts cauſe it to do, all which I have experienced this year 1703.

A late harveſt no hurrying harveſt.

§. 21. Barley, in carrying to market, ſay our farmers, need not be covered, rain it never ſo hard, but wheat is thought the worſe for rain.

Of covering corn, in carrying to market.

§. 22. Mr. Ray conjectures, that the reaſon why the grain is generally thin, when corn grows very rank and thick in ſtraw, is, not only becauſe it's ſtrength is exhauſted in the groſsneſs of the blade, but, ſays he, that groſsneſs of the blade may hinder it from the cheriſhing rays of the ſun, which are neceſſary to concoct the nutritious juices, and to convey them into the ſeed, and he gives an inſtance of our ſowing Engliſh corn in America. Hiſt. of Plants, vol. 2. fo. 1238.

Why rank corn brings a thin grain.

§. 23. Since (as by former remarks does appear) the wheat-ear is worſe for it's ſtraw being broken, and for the ſun's not coming to it's root, it follows that, where vetches run ſo rank as to finnow in their halm, the ſtraw and the juices conveyed through it muſt be ſo prejudiced as to carry a thin grain.

Thin-grained vetches from finnowy halm.

§. 24. Anno 1707 the winter proved exceeding wet, and the ſpring and ſummer were the ſame, inſomuch that the harveſt was very backward, and it was the middle of Auguſt before we began to cut wheat: the conſequence of theſe wet ſeaſons, as I conceive, was, that the wheat in cold clay-lands blighted, of which I made a general obſervation: the reaſon I take to be, becauſe, theſe three ſeaſons proving wet, the harveſt was backward and late; and the rains being frequent till harveſt, the vegetable juices, eſpecially in clay-lands, were heavy and chilled, and could not riſe to nouriſh the grain and the ſtraw; for which reaſon, both being ſtarved, the ſtraw turned white and ſpeckled, and the grain ſhrank, and, as I obſerved, in ſuch lands the ſtraw of red-ſtraw wheat did not that year look red; but from it's green colour turned to white; but in white or warm land the wheat eſcaped blighting, becauſe there the vegetable particles were attenuated enough to aſcend.

Why wet ſeaſons bring blighted corn.

Tho' the wheat was ſo much blighted in the year 1707, yet barley and oats this year did not blight, but were full grained, whether, becauſe they had not been pinched by the winter, not being then ſown, or from their lying on a mellower mold and hollower from being later ploughed, whereby the ſun might inject his comfortable rays the better, I know not.—We find no ſummer too hot for wheat, tho' it may for barley and oats.

Cauſe of the uſtilago or burnt-ear.

§. 25. Of the cauſe of uſtilago or the burnt-ear in corn Mr. Ray gives his conjecture, fol. 1241 and 1242;—But my opinion is that it proceeds from a defect in the root, but then that defect muſt be attributed to ill ſeed, with a diſtinction that makes no difference in the effect: the ſeed might be damaged before it was ſown, or the nature of the ground might occaſion the defect; for what difference is there between corn originally bad and that damaged by keeping, or taking damage in the field, before it could come up, by being almoſt malted, or otherwiſe injured in the ground by it's ill temper, or an unſeaſonable ſeed-time? What happened very obſervable to clear this matter was, in the ſpring-ſeed-time 1704 I ſowed very good ſeed-barley in all my grounds; therefore no fault in my ſeed; ſo did many other farmers; I could find little uſtilago in my oats; they being ſowed early their ſeed came up, and lay not in the ground to take the damage abovementioned, and the oats which were ſowed early, on which rain came, had not the uſtilago, nor the barley ſowed early, except ſome little matter occaſioned by their being ſowed in white lands, but the middle ſowing, when the ground had not moiſture enough to bring up the corn, nor had had any rain fall on it for a long time, was injured in it's ſeed, and turned mightily to the uſtilago all over the country, but the latter ſowing, after which rain came, had little of it: hence may appear the great benefit of rolling. The uſtilago is common to the ears of graſs as well as of corn, in which I have frequently obſerved it, eſpecially in the gramen caninum nodoſum avenaceâ paniculâ, or knotty-rooted dog's-graſs.

In June however (1705) I gathered diverſe ears of black-burnt wheat, all burnt to a black powder; I alſo gathered ſeveral of the ſtrong and good ears; I found the ſtraw of the burnt ears drew with as much difficulty out of the ground as the beſt, and had, to my eye, as good mores; I cut every joint of the reeds in many places, both of the ſound and burnt-eared ſtraw, and found them to my eye, equally ſound, and as much verdure and firmneſs in the ſtems that bore the burnt grains as in the others, and many of the ears I found ſo burnt before they came out of the hoods; ſo that I am again at a loſs to conjecture what the cauſe ſhould be. By the bigneſs of burnt grains it ſhould ſeem, that this misfortune fell on the ear, when it was of pretty tolerable length, and yet before it was half grown in the huſk; for it is moſt certain that theſe grains could not grow after they were burnt. See farther of the cauſes of ſmut and blight under the article Wheat, §. 10. ſee alſo Barley, §. 24.

WHEAT.

A wheaten crop leaſt profitable.

§. 1. A Wheaten crop is the moſt unprofitable of any to a farmer by reaſon of the charges,—and becauſe a farmer ſees not a return of that uſually under a year and an half.

Why land with a ſword beſt for wheat.

§. 2. It is commonly ſaid, that ground, which has got a ſword, is beſt for wheat,—and therefore farmers are apt to ſay, that land, which is not inclinable to graſs, is not fit to be ſowed with wheat, till it has got a ſword,—whereas the leſs ſword any ground has the fitter it is for any ſort of corn, except it be white ground that wants a ſword to hold it together.—But a ſword on ground is an argument that it has lain lay the longer, and lying out of tillage makes all ground the better: I know no other way of ſolving the abovesaid obſervation of the farmers.

Of the hardineſs of wheat.

§. 3. This year, 1717, we had no rain from about the middle of March to the 22d of May, (unleſs, a moderate ſhower on the 7th of May, and ſome ſmall thunder-ſhowers, of which laſt our neighbourhood had no ſhare) and yet my twenty acres of wheat on a ſide-long white-earth-ground of about ſix-pence per acre, and ſix acres more of wheat on the like ſort of ground, did thrive ſomething all the while, and loſt not much of it's colour, which ſhews how hardy a grain wheat is: during the aforeſaid time we had alſo for the moſt part very dry huſky winds, hot ſun by day, and froſt by night: it is true we had an exceeding wet winter, which might beat the white ground the cloſer.

In cold dry ſprings and hot dry ſummers there is a great difference between the wheat and barley harveſts ripening; for this year 1714, was ſuch as abovementioned, when I began wheat-harveſt July the 20th and ended Auguſt the 5th,—but did not begin to cut barley till Auguſt the 16th, and in a lingering manner ended the 30th. The reaſon was, becauſe wheat, being a hardier grain, was not checked by cold, nor heat, nor drought, it's roots being well eſtabliſhed and the ground well ſettled to them; but barley, being a tender grain, was pinched and retarded by the cold; the ground being late ploughed in the ſpring lay hollower and lighter, and conſequently more ſuſceptible of heat and cold.

Of it's tillowing.

§. 4 It is not eaſy to be convinced, if ground be in good heart, though wheat may look very thin all the winter, and till May, how ſtrangely it will tillow and fill up, if not hindered by weeds: this I have often obſerved in my wheat,

Different kinds of wheat.

§. 5. [a] The Bluebury wheat is the red ſtraw-lammas, not the white ſtraw-lammas: there is another ſort of wheat they call the white white, be-

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[a] Mr. Miller reckons up thirteen characters of wheat, viz. 1. White or red wheat without awns.—2. Red wheat, in ſome places called Kentiſh wheat.—3. White wheat.—4. Red-eared bearded wheat.—5. Cone wheat.—6. Grey wheat, and in ſome places duckbill wheat, and grey pollard,

cauſe the ear and grain is ſtill whiter than the white-lammas.—Then there is the bearded or Poland-wheat, which has a ſtiffer and ſtronger ſtalk, and is therefore often ſown in wet cold clay-lands about Wiltſhire, becauſe the ſtalk bears the wet better without rotting or lodging. Theſe are the chief ſorts I have any experience in.

Of red-ſtraw wheat.

§. 6. Mr. Raymond aſſures me that he finds red-ſtraw wheat, if ſown at the ſame time with any other wheat, will be ripe a fortnight ſooner. Note—All precociouſneſs in the ſame ſpecies implies a looſeneſs of texture, and weakneſs in parts: I noted before that red-ſtraw wheat and rath-ripe barley were apt to fall and be knee-bent, and therefore the one was often ſowed, in deep lands that were apt to run rank, with great wheat, the other with battle-door barley to ſupport them, theſe being ſtronger in ſtalk.

Of Thracian wheat.

§. 7. Mr. Ray tells us of a certain Thracian wheat, which they ſow there in the ſummer, to avoid the cold; this wheat, ſays he, is ſowed on light ground, and never has but one culm or ſtalk; it ripens in three months. What is more remarkable of it is, that it does not yield to any other wheat in weight, and has no bran. He thinks however, that this wheat is not of a different ſort from the common wheat there, but that it alters it's nature, and grows tenderer by being ſown in the ſpring, which is a property worth noting.

Branch-wheat.

§. 8. I ſaw ſome branch-wheat, ſo called, becauſe the ear is branched into ſmaller ears iſſuing out of the main ear: of this I have no experience; and can only ſay that a gentleman, who is well acquainted with it's properties, tells me it makes the beſt frumenty that is, and the beſt pudding, and caſts as yellow a colour without eggs as other wheat does with eggs.

Of ſmut. Smut produced from poor ground ſowed with large-grained wheat.

§. 9. Diſcourſing with farmer Bachelour of Litchfield about the beſt choice of ſeed-wheat; he ſaid, he loved generally to chooſe a middle browniſh ſort of grain, not the largeſt bright and ſmooth fat corn.--I aſked him why he was againſt a large fair grain; he ſaid, becauſe he obſerved ſuch grain was apt to carry a ſmut.—If this be true, as probably it may, I know of no reaſon to be given for it, except that Litchfield-farm being generally a poor ſoil, and lying pretty cold, cannot maintain and feed the root, ſtalk, and ear of ſuch fat ſeed ſo well as it can thoſe of the ſmall grain, and ſo the ear of the large-grained wheat mortifies and corrupts in the ſap, for want of nouriſhment, before it comes to be flour, which is the time for wheat to take ſmut.—It is manifeſt from many experiments I have made, that the number of the roots, the breadth of the leaves, and the length of the ears carry a proportion to the ſize of the grain, but poor ground cannot maintain it, and ſo produces a ſmaller root, leaf, and ear than ſuch ſeed would naturally put forth, all which impairs the ſtamina of the increaſe, whereby the ear is depraved, and liable to ſmut; but where (as at Crux-Eaſton) ground is ſtrong clay, tho' very cold, this objection may not hold good.

Another

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pollard.—7. Polonian wheat.—8. Many-eared wheat.—9. Summer wheat.—10. Naked barley, or triticum ſpicâ hordei.—11. Six-rowed wheat.—12. Long-grained wheat.—13. White-eared wheat. But ſome of theſe, he ſays, he takes to be only ſeminal variations, and not diſtinct ſpecies.

Another farmer told me, he looked on the ſmall-grained wheat to be better ſeed-wheat than the great yellow wheat; for, ſaid he, the latter ſort is apter to ſmut; beſides a buſhel of the ſmaller grain contains ſo many grains the more, which is a great matter: he added however, that the ſmaller the grain the earlier it ought to be ſowed; becauſe, if winter came on upon it, that might prevent it's ſhooting ſo many blades, as otherwiſe it might have done. I ſoon after conſulted two other very knowing farmers about this matter: they were of a different opinion, and ſaid, the bigger the ſeed was, of either wheat or barley, it would give the greater more, and have more blades.

Of the cauſe of ſmut.

§. 10. I looked into Mr. Wilſon's ſmutty and blighted wheat, in order to diſcover what might be the cauſe of ſmut and blight. The ſmutty ears are perfect in the cheſts, and almoſt ſo in the fulneſs of the grain, even ſo far that the cheſts of many ears did ſtrut; ſo that the ſmut muſt fall on the grain late, and when it is towards a fulneſs, for it cannot grow after it has taken ſmut. I could very rarely find a ſmutty ear but all it's tillows were ſo too; ſo that from thence I conclude the ſmut ariſes from the root, and not from any poiſon in the air, which would not diſtinguiſh between the tap-root and the tillow. I alſo obſerved in the fibres of the roots of the ſmutty wheat a general brittleneſs, and the earth more ſtarky and dry about them, and I perceived, for the moſt part, a ſtream or ſtreak of a brown ſtain, the breadth of a pin, in the firſt joint above the root. So that I am apt to believe that a ſmut ariſes from a total defect of ſap at the root, and a blight from a partial one, when ſome of the fibres may ſtill live; ſo the grain, being feebly ſupported, does only ſhrink or wither.—As for the early ſmut that falls on the ear, even before it is out of it's hoſe, wherein the covering or chaff is alſo ſmutty, and all in a light powder, this ſort of ſmut ſeems to ariſe from the ſame cauſe as the former, only the ear having not as then obtained a firmneſs, it's rottenneſs becomes more hollow and powdery, and of leſs conſiſtency than the ſmutty ears that have obtained a firmneſs. On the whole therefore, notwithſtanding the latter part of my remark, §. 25, under the article Corn in general, where I ſay I could not diſcover any difference between the roots, ſtems, or joints of the ſtems of the burnt-eared wheat and the ſound, I am ſtill of opinion that both the uſtilago and ſmut proceed from a defect in the root.

Some farmers were ſaying, that dunged land, as had been always obſerved, was more ſubject to ſmutty wheat than folded land. If ſo, the reaſon muſt be, becauſe the dung hollowed the ground, and therefore the longer the dung the greater the danger.

I have in another place obſerved, that ſmutty duſt on ſeed-wheat may produce ſmutty wheat, and no wonder, ſeeing the ſeed immediately after ſown ſwells and imbibes the ſmut with the moiſture, and the nib or chiſſum of the ſeed is corrupted and poiſoned thereby. The nib of the ſeed is not one fourth part ſo big as a pin's head.--Seed blacked with uſtilago does not hurt like ſmut, becauſe the hot burning quality of the uſtilago is waſhed out of it by the rain, and purified from it by the air, to both which it is expoſed.

Of ſowing thin blighted wheat.

§. 11. I ſowed new wheat, but obſerving much of it to be withered and blighted, I ſhewed it to ſome of the farmers, and they, but particularly farmer Biggs[b], ſaid, it was never the worſe for that, and it would grow as well as if it were otherwiſe, and bid me put ſome into the ground to try whether his words were true or not.—I aſked Thomas Elton about it, and he ſaid, if it were not blighted and withered to a ſkin, but only ſo as to have very little flour, he alſo thought it would grow; but then, ſaid he, I have known it to die away afterwards.—I aſked him, how he knew it was that wheat, and how he knew it was for that cauſe it died; he replied, becauſe he had in ſuch caſe ſcratched up the root, and found that there was not flour or milk ſufficient to maintain the blade till it could take root.

I met farmer White and farmer Bachelour of Litchfield in the market; I told farmer White how thin his ſeed-wheat proved that he ſent me, and that it was exceedingly blighted; and that I was ſatisfied, let the farmers pretend what they will, that blighted wheat, if ſowed late in the year, tho' it might come to a blade, yet the flour or milk that ought to maintain it would be ſpent before it could * more; and then, if froſts came, it would be in danger of dying.—They agreed with me, that, in caſe it was late ſowed, it was their opinion alſo, but it would do well if ſowed early;—but, ſaid farmer Lake an hour afterwards, when I was ſpeaking to him of it, let it be ſowed early or late, give me a full bodied wheat.

* root.

Muſty wheat will not grow, and why.

§. 12. Many farmers, and indeed all I have talked with on the ſubject, agree that muſty wheat, though not grown out, will not grow.—I ſuppoſe it is becauſe the ſeminal part is malted, tho' it does not outwardly ſhew itſelf, as it does when it is grown out.

Rath-ripe wheat preferred to white-lammas wheat by the meal-men.

§. 13. Farmer Biggs ſays, he always ſows the Bluebury wheat, that is the rath-ripe wheat.—The meal-men do not like the white-lammas wheat; they ſay, it does not caſt ſo fine a flour.—Thomas Elton alſo ſays, they ſeldom ſow of the white-lammas wheat,—and both he, and farmer Biggs ſay, the meal-men know it from the other better than they do who ſow it.---Thomas Elton ſays, he has been at Reading with it, and could not have ſo much by twelve ſhillings in a load as for the Bluebury wheat tho' of the ſame goodneſs.---I aſked him, if they did not obſerve to ſow the white-lammas wheat earlieſt, becauſe of it's being laſt ripe;---he replied, he found no difference in that, but that it was ripe as ſoon as the other to the full.

Brining and liming wheat. Vid. ſowing wheat.

§. 14. [c] The original of brining and liming ſeed-wheat ſeems to be purely an

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[b] Mr. Tull is of the ſame opinion with farmer Biggs.

[c] Mr. Tull obſerves, that brining, and changing the ſeed are the general remedies for ſmut; the former of theſe he has heard was diſcovered, about ſeventy years before he wrote, by ſome wheat being ſown, that had been ſunk in the ſea, and which produced clean corn, when it was a remarkable year for ſmut all over England; but he afterwards doubts whether this might not happen by it's being foreign ſeed, and therefore a proper change for our land. He tells us of two farmers, whoſe lands lay intermixed, who uſed the ſame ſeed parted between them, and from a good change of

Engliſh practice; for which there is a ſtory.—Neither the Rei ruſticæ ſcriptores, nor Pliny take any notice of it.

Sharrock ſays, brining and liming wheat may defend it againſt grubs, inſects, and worms, and fortify the grain, but he cannot think it any ſecurity againſt blights, &c. See fo. 99.

I had wheat brined and limed for ſowing, but much rain coming, and the ground being wet, I could not ſow it for a fortnight; at the fortnight's end I had ſundry people with me about meaſuring harveſt-work, ſo I aſked their opinion whether ſuch wheat would grow or not;---one ſaid, he had known wheat that had not been brined and limed above a week, and a great deal of it did not grow.---Another ſaid, it depended on the high degree to which it was limed, for, if it was ſo high limed that it ſhrunk and ſhriveled, it would not grow, but, in caſe the rind looked plump and ſmooth, then there was no danger. A third was of opinion, that there was a great difference in the manner of brining it, for, if the wheat had been ſteeped in brine, it would be much apter to burn by lying in lime than it would having been only ſprinkled with brine in the morning it was limed.---Note, this brined wheat was not ſowed till November 7th, which was ſeven weeks after it was limed, and yet it grew, and came up ſo thick that it ſeemed to have received no prejudice.

Cautions—to ſow wheat under furrow in the hill country; not to harrow too fine; nor to cut hedges too early for fear of the cold winds.

§. 15. It was univerſally obſerved this laſt winter, (anno 1708) that the wheat which was killed was not killed by froſts, tho' they were very intenſe, but by the winds, which drove the froſty particles in ſuch a manner as to penetrate into the roots of the corn; this may be ſuppoſed to be effected with their angles, which lanced the fibres and cut them in pieces, like as fire by it's ſubtle corpuſcles in it's rapid motion may be ſuppoſed to penetrate and divide bodies.—It was plain the wheat on our hills in Hampſhire and our high grounds, was canonaded, for the driven ſnow, as it was carried to the hedges by the wind, battered the wheat and cut off the blade, and the wounds it made opened portals for the fierceneſs of the weather to enter the roots.—Wherever the wheat lay out of or ſheltered from the wind, in thoſe places it was ſaved; and the furrows of grounds, where by lying wet (and this was a wet winter) the wheat is always worſt, were, if the ridges croſt the wind, the beſt, becauſe the ridges ſheltered the furrows, but, if the ridges and furrows lay parallel to the north, or north-eaſterly wind, then the wheat in the furrows was alſo deſtroyed, but wheat lying under the ſhelter of hedges was ſaved.—From the ſad experience of this year we may in our hill-countries conclude it to be good huſbandry, to have a ſpecial regard, in the ſowing of wheat-lands that lye expoſed to the north or eaſterly winds (for it cannot be ſuppoſed any danger can come from the ſouth or weſt quarter) firſt, to ſow under furrow, or at leaſt a

caſt

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of land, and aſſerts, that the one, who brined his ſeed, had no ſmut, but the other, who neglected it, had a very ſmutty crop; but again he doubts whether this ſeed might have been changed the precedent year, and ſo might not be greatly infected, no more than what the brine and lime might cure. He adds alſo, that ſmutty ſeed-wheat, tho' brined, will produce a ſmutty crop, unleſs the year prove very favourable; for favourable years will cure the ſmut, as unkind ones will cauſe it.

caſt over and a caſt under, that thereby the wheat may lie the deeper both from the penetrating power of the winds and from their power of uncovering the earth, and laying the roots of the corn naked; ſecondly, to leave our grounds a little rough, and not harrow them too fine, it being obſerved that the wheat ſaved itſelf much better when the knobby clods ſheltered it;—thirdly, to have a regard, where grounds lie bleakly expoſed to thoſe winds, not to cut down the high hedges, which may be a fence to it, before February.

Obſervation on the growth of wheat.

§. 16. The 20th of November, (anno 1704) I obſerved the wheat on the ground, and that the firſt, or capital branch, conſiſted of an upright ſpire, between two leaves falling on the ground; but the iſſues or tillows, be they never ſo many, had but one leaf on one ſide of the ſpire, by which the iſſues are to be diſcerned from the main branch; and in both good and poor wheat the difference was the ſame.—I know not therefore what the Latins meant, when they ſaid, wheat muſt not be raked till it has four leaves, nor barley till it has five.—The ſame day I obſerved the tillows of rye-graſs, and found that both the capital germen and the tillows do conſiſt of but one ſpire iſſuing from the middle of two graſs leaves, and therefore different from that of wheat.

Obſervation on the ears and roots of wheat, and inference to ſow little land and good.

§. 17. It was the 23d and the 24th of June (anno 1703) I made the following obſervations with relation to the ears of wheat: in one field there were, for two acres together, generally in an ear ten cheſts on a ſide; about four of the middle cheſts on each ſide contained five grains, viz. two on each ſide the middle grain; but the uppermoſt and lowermoſt cheſts fell off gradually to four, three, and two grains in a cheſt.—I went into another field, and could not find above eight or nine cheſts in any ear there, nor in any of the middle cheſts above three grains, viz. one on each ſide the upright middle one; and ſo again the uppermoſt and lowermoſt cheſts fell away gradually into two, and but one grain in a cheſt; yet this land had been well dunged.—In another field it was manifeſt, that part that was dunged carried not ſo long an ear, nor ſo many grains in a cheſt as that part of it that was folded, and ſowed on one earth; but there were many of the ears of the folded wheat that held out ten cheſts, and had five grains on each ſide of the two middle cheſts: how theſe ears might prove I knew not, very little of the wheat being blown.—I alſo obſerved the partitions of the cheſts to open, in order to let out the bloſſoms; which when ſhot out, they cloſed again, and the bloſſom hung dangling on the outſide by a hair as fine as a cobweb: till I made this diſcovery of the cheſts opening, I uſed to wonder how ſo fine a thread could thruſt out the bloſſom.—Then in another field I obſerved the limed wheat to be of a moſt vivid ſcarlet in the colour of it's bloſſom, more lively than the flower of that in the firſt mentioned field, which was a more duſky ſcarlet; yet it exceeded the flower of my other pieces of wheat, which generally did not come up to the colour of that, having a more wan and ſickly ſcarlet coloured bloſſom.—I alſo pulled up ſeveral roots of wheat, ſome of which had ten tillows; for I waſhed their roots, and found them all joined in one.

Now, if ſome roots of wheat have ten tillows, others but two or three;—if ſome ears of wheat have ten cheſts of a ſide, others but ſix or ſeven;—and ſome ears have five grains in the beſt cheſt, others but three, and two, I leave it to be conſidered what encouragement there is to ſow little land and good.—The ten-cheſted ears at four middle-cheſts each ſide, with five grains a piece, make forty grains; the twelve other cheſts, at three grains in a cheſt, make thirty-ſix.—The weak wheat has but twenty-ſix grains in an ear, and ſix tillows leſs, and it's two tillows muſt alſo hold but in proportion to the top ears.

Of the ears of wheat on land ſhaded from the ſun.

§. 18. I went under a hedge, where my wheat was almoſt as high as my head in the head-land, the reeds very ſtrong, the cheſts ten or eleven on a ſide; yet I obſerved the bloſſoms generally to be very pale and ſickly, of the colour of aſhes on a dying coal, and I ſeldom found above three grains in a middle-cheſt: theſe defects I impute to the head-land being ſhaded from the ſun; for by the length of the reed, the many cheſts, and by my own knowledge of the ground, it was very ſtrong; but doubtleſs thoſe grains muſt run very thin at harveſt.

Farther obſervation on the ears of wheat, and why nature furniſhes more cheſts than ſhe can fill.

§. 19. July 6th (anno 1703) I viewed a field of wheat, the bloſſom being juſt over; I plucked ſome of the cheſts, and found, tho' proviſion had been made for three or four grains in a cheſt, yet in many of them there were not like to be above two or three grains, and I found in thoſe failing grains their bloſſoms pent up and withered, the grains not having ſtrength to emit:—and in thoſe ears, that had the withered grains, I found the outmoſt grains in the cheſt on each ſide to be beſt maintained, nature having deſerted the others, not being able to maintain them.

Whereas I had obſerved in the flowering of the wheat, that, the ears being large and the cheſts broad, there were in the middle cheſt of the ear five grains that had flowered, which I apprehend to be the full complement in the middle cheſt of an ear; examining theſe ears and cheſts about a fortnight or three weeks after I could in none of the middle-cheſts find above three grains of wheat, in many but two.—If you aſk, where was the advantage of theſe ears producing ſo many cells, when but two or three grains, or cells in a cheſt came to maturity? I anſwer, the advantage was very great; for in the firſt place they are a ſign of the fruitfulneſs of the root, and, if two cells do decay, the other three will be the better maintained, and have the fuller grain. Secondly,—where in the wheat flowering-time there are the more cells in a cheſt that bloſſom, they can the better maintain the loſs by all accidents that may happen; for inſtance; if one or two grains in a cheſt fail at flowering-time by a fly-blow (it being often the caſe) there are bloſſoms enough in the cheſt to make good that loſs by maintaining three good grains in a cheſt; whereas in ears that are weak, and produce but two or three bloſſoms in a cheſt, if thoſe bloſſoms ſhould be blown, all muſt miſcarry.—I was apt to think however, that of the five bloſſoms produced in a cheſt there could but three prove good, nature not being able to maintain more; and this I concluded, becauſe it could do no more by my wheat, which grew in general on exceeding good ground; and the cheſts were ſo conſtructed, that it ſeemed to me, there could be room for no more grains in a cheſt; but on coming from Ilſly to Oxford I obſerved ſome mighty rich land, that had large eared wheat, many of the ears containing twelve cheſts on a ſide; I am now therefore convinced, nature is not confined, as above hinted, to five bloſſoms in a cheſt, for in the middle cheſt of theſe ears there had been ſix, if not ſeven bloſſoms, the two middlemoſt of which nature was not able to maintain, and ſo they withered, but I told in thoſe cheſts five compleat grains full kerned.

A defect in wheat not commonly taken notice of.

§. 20. In viewing my wheat, when it was near full kerned, I obſerved ſome withered ears, which in all their cheſts looked dead; the grain was ſhrunk and withered, tho' in other reſpects good, for it had a ſound flour, but the ſtraw was dead to the root, and that drew up eaſily, the fibres ſeeming dead and dry; ſo that this is a farther, and another ſort of defect in wheat than either ſmut or blight, viz. by worm, or burnt.

Of the tillowing of wheat.

§. 21. April 14th (anno 1705) I firſt obſerved the manner of the tillowing of wheat: the ſpring-tillows, for the moſt part, do ariſe from the foot of the root of the winter-ſtems or ſhoots, which may be two, three, or four, according as the wheat is in proof; they ariſe from that foot, and, when they break out at firſt, they may be perceived by the eye in a bud ſmaller than a pin's head, containing a cryſtaline pellucid juice; which bud is ſecured by the coat of the outward leaf of the mother or winter-ſhoot, between which coat and the inſide-coat of the winter-ſhoot this tender bud paſſes along, as through a ſheath, whereby it is protected from outward injury, till it is ſo well grown as to break forth with it's green ſpire; from the ſide of this winter-ſhoot now and then only one of the ſaid ſpring-ſoboles does ariſe, and now and then another on the contrary ſide, and perhaps a third or fourth on the other ſides, according as theſe winter or mother-ſhoots are in a flouriſhing condition, till at laſt they, being grown thick and ſtrong, open the ſocket of the ſaid outward leaf, which girds them cloſe to the mother-ſtem, and ſo ſtand independent, wide off from it; and then that old leaf becomes uſeleſs and dies.—This day I alſo obſerved a new pearly brood of ſoboles at the root of the ſaid winter-ſhoot, in the manner as the other before deſcribed, no bigger than a pin's head; but whether it be not now too late for them to come to maturity is a queſtion: it is very probable warm and dry weather may very much conduce thereto.—The firſt and earlieſt ſoboles or tillows aboveſaid, being at this time ſhot up into the open air in a ſpire, ſeem by their growth to have made a bud very early in the winter, which another year may perhaps give me opportunity to enquire into. From many experiments I have made, by ſowing corn in pots, I find, that, when a maiden ſpear has been dead, no collateral ſpear has ſhot from the ſame baſis, but that the tillows are properly offsets from the maiden ſtem.

When wheat ſprings with a thin blade it ſeldom recovers itſelf in poor land.

§. 22. The autumn (anno 1714) wanting rain, the ground, at the beginning of wheat ſeed-time, was but juſt moiſt enough to bring up the corn: the farmers (who kept on ſowing) obſerved that the corn, which came up before any rain had fell, had but a thin blade, and was of a dark colour, wanting the broad leaf and golden colour they expected: it fell out the ſame with me in the ground I ſowed under furrow, tho' the moiſture was ſufficient to bring up the corn thick enough.—Farmer Iles and farmer Box, my tenants in Wilts, obſerved the ſame thing in wheat they ſowed at the beginning of wheat-ſeed time.—It's not unlikely but this drought might do no prejudice where the land is very good; for tho' the thin blade, &c. certainly ſhew the root and ſtalk to be weak, yet in rich land they might ſtrengthen when rain came; but where ground is poor, when wheat comes up thin in blade, it is a queſtion whether it will ever recover, and get a good root, ſtalk, or blade, tho' rain ſhould come.—This narrow leaf is occaſioned from the earth's not giving up the juices freely at firſt.

Of the length of the ſheaths of wheat grains.

§. 23. In turning up wet wheat ſtraw (laid together in a heap the beginning of November 1702) I found in January many looſe grains ſpeared out, but, on account of the thickneſs of the wadd of ſtraw laid on them, they were not able to ſhoot thro': I meaſured their white ſtiff ſheaths, thro' which their blades paſs, and they were from four inches to five inches and an half long. Now, theſe grains having liberty to ſhoot their ſheaths to their utmoſt extremity, according to the reſpective vigour of each grain, and not being hindered by the ſtraw, I infer that thoſe lengths are the utmoſt lengths their ſheaths will reach to; ſo that, if the grain is buried below ſuch depth, the ſheath cannot protect the blade, nor give it ſafe convoy farther, but it muſt venture its own ſelf to get thro'. I obſerved however a round wiry ſubſtance the blade carried, an inch upwards from the opening of the ſheath, and before it opened into the leafy blade, which, tho' leſs in compaſs, and leſs ſtiff than the ſheath, yet ſeemed of a ſtrength better able, than if it had been a leafy blade, to penetrate upwards, if the ſheath could not carry it into air. I infer alſo from the different lengths of the ſheaths, that theſe lengths depended on the reſpective powers of the grain, ſeeing they had the ſame bed of ſtraw, and were all buried the ſame depth: it would be well therefore to try old grains and new, and lay them at different depths, and ſee what foundation it would give to farther conjectures. I obſerved the ſheaths, which had ran out ſo far, were much weakened by it, and had not that ſtiff ſtrength that the ſheaths of common ſown wheat has, which lies ſhallow. The graſſy blade had ſhot forth two inches into the dunghill, but looked of a yellow ſickly complection.

Of the knots in wheat ſtraw, and the growth of wheat.

§. 24. In cutting many wheat reeds I obſerved all their lowermoſt joints were ſhort, of two or three inches in length, and without hollowneſs, and that they gradually lengthened and hollowed; which was in reaſon ſo ordered by God, for the better ſtrengthening the reed to ſupport the grain. The fourth joint in all the reeds was very hollow and very moiſt; ſeveral drops of water came from moſt of them in that joint; whether it was occaſioned by the very wet May and June, or not, I cannot tell. Again, from that joint the next above grew leſs hollow, and the uppermoſt, that carried the ear, had no hollowneſs, but a green ſtrong hood, wonderfully contrived for ſtrength, to ſupport the grain. The hoods of the firſt joint were dead, (theſe I take to be the two dying leaves that begin to appear in May) ſo were the hoods of the ſecond joint, that being of ſuch ſtrength as not to ſtand in need of them; but the two laſt and uppermoſt hoods ſeemed carefully to protect thoſe whole joints reſpectively, and to ſtrengthen them. I alſo obſerved the tillowing ears, which, tho' they were ſuckers from the trunk of the tall reeds, that bore the long ears, yet they had two or three ſmall roots of their own, on which they ſeemed to depend. Quinteny obſerves, the ſap ſhoots to the topmoſt branch moſt vigorouſly: ſo it certainly is in the wheat-ear; for, if any grains in the ear are wanting, they are the lowermoſt.

Of feeding wheat with ſheep.

§. 25. Being at farmer Sartain's at Great Chavel in Wilts, I ſaid, that one advantage of ſowing wheat early was, that it might fat ſheep, if it was too rank.—Sartain replied, he did not approve of that huſbandry; he thought it a preſumption, and ſaid, it would be very apt to make the wheat fall and lodge, and carry but a light ear notwithſtanding.—I aſked him how ſo; he ſaid, it would ſhoot forth a ſmall weak ſpindle after feeding it, and if the ſtraw was ſmall the corn muſt be ſo too.—I ſpoke to farmer Miles on this ſubject; he ſaid, he looked on feeding not to hurt the wheat in the leaſt, if it were not fed late: it is true, ſaid he, if it be fed after the ſpindle begins to ſhoot, it would be the ſame as feeding French-graſs, for then, as Sartain ſays, the firſt ſpindle being taken off, there would come up a weak iſſue or ſpindle by it.—Sartain gave me three or four inſtances on his ſide the queſtion, and Miles the like on his; and the latter carried me to view a part of Mr. Brewer's farm, which was anno 1699 eat up bare, and had as good a burden of wheat as any in the county.—He looks on the difference therefore to be as above.

Major Liver and I diſcourſing of the miſchief wheat might receive by being fed down with ſheep,—eſpecially, ſaid the Major, to feed it as many farmers do, who ſeem to be cautious, and think to be ſure to do no harm, and ſo they only put in a few; whereas, were I to feed wheat, I would put in as many as ſhould eat it down directly; for, when there are but a few, they only crop what they ſhould not, viz. the youngeſt ſpindles.

I cannot imagine why wheat ſhould be fed at any time, unleſs it be by one evil to remedy a greater: if the wheat be not ſo forward as to have tillowed into ſmall ſtiff ſpindles, long enough for the ſheep to eat it, they can only eat the leafy blade; but I cannot ſee how that puts the ſpindle the backwarder; it rather ſeems to forward it, and ſtrengthen it, foraſmuch as the ſap, which had the leaf to nouriſh before, has now only the ſpindle, which conſequently muſt grow the faſter and ſtronger.—But if the wheat be ſo ſpindled, that the ſheep can bite the ſpindle off, then it will put it backward to a great miſchief, inaſmuch as ſo ſtrong a ſpindle will never grow up again from that more or root, nor carry ſo good an ear as that would have done: indeed if a favourable ſpring comes, eſpecially if the ground be good, the country-man may think he can be no ſufferer, becauſe he may, notwithſtanding this, have a good crop.—Yet it muſt be confeſt, that one muſt reſort to the evil of feeding, if the wheat be ſo exceedingly forward as to ſhoot into ear too early in the ſpring.

When I ſhewed farmer Crapp and farmer Ginnoway ſome young green wheat, and let them ſee there was a young ear above ground no bigger than a pin's head, they both confeſt, it was madneſs to feed wheat with ſheep, eſpecially in our hill-country, where the land is not rich; for in ſuch land, if the maiden-ear be eat off, it muſt be a weak brother that puts forth in it's room, whatever better may happen in rich land.

Mr. Eyre tells me, that farmer Lake of Faccomb is very much againſt feeding burn-beaked wheat, and ſays it will occaſion it to blight.—I aſked Mr. Eyre why the farmer thought ſo. He ſaid, he could learn no other reaſon for it, but that it would be the later ripe, and the backwarder corn is in ripening the more ſubject it is to blight.—Note, this obſervation, however he, or any other notable farmer came to make it, pretty generally holds true, though the true reaſon, why feeding wheat ſhould make it later ripe, the farmers are at a loſs to diſcern.—The true reaſon hereof I have before proved, viz. that the ears of wheat in February and March are an inch or two above ground, which maiden-ears the ſheep eat off, and then nature is put back to form other ears, which muſt neceſſarily put the harveſt backward, it may be a fortnight, and alſo produce a weaker ſtraw, more ſubject to lodge and fall, in the room of the maiden-ſtems bit off, and probably with a ſhorter and weaker ear, unleſs the ground be very good.—This is like to be the natural conſequence of feeding wheat with ſheep in the hill-country, where, by reaſon of the cold, the harveſts at beſt are backward; but theſe ill effects may not happen where the ground is warm and good, and the country lies low.—If proud wheat were mowed two inches above the ground, this would prevent the miſchiefs of feeding; but then I do not ſee how it would prevent the rankneſs and lodging of the wheat, ſince, the ear not being cut off, nature would not be put backward; for the cutting off the leafy-part ſignifies neither one way nor other; for that makes no advances after the end of May, but then rots.

Of the farrition or raking wheat among the antients.

§. 26. Whereas the Rei ruſticæ ſcriptores direct the ſarrition of wheat when it comes to have four leaves, as taken notice of before,—I have been at a loſs to diſcover the four leaves of wheat, becauſe it puts forth only three leaves, nor could I ever obſerve more.—But note, the two collateral leaves die in about two or three months time, and then more leaves put forth; ſo that in England four leaves never appear at one time, but in a warmer clime, as Italy, the latter leaves may put out before the former are dead, and ſo four green leaves may be ſeen at the ſame time.

Sign of good wheat.

§. 27. When the ears ſtrut, and the cheſts ſtand open, it is a ſign the grain plims well, and is full.

Sign of wheat's being at a ſtand in growth.

§. 28. In the beginning of May (anno 1707) my ſervant ſaid, my wheat, for want of rain, was at a ſtand in it's growth.—I aſked him, how he knew it; he ſaid, by the ſpikineſs and ſpearineſs of the tops; for, when it does not thrive, it runs to a ſharpneſs at top, and does not hold broad as when it thrives.

Time when the grain is firſt formed, at April 15.

§. 29. It was the 15th of April (anno 1702) I firſt obſerved, that the ear was ſo early formed; for in pulling away the valves, which were five, at laſt I found the ear in it's cradle, or inmoſt valve, which valve was of the length of three pins-heads; the ear itſelf not above two pins-heads in length: I could not diſcover it's parts with the naked eye, but with the microſcope I could diſtinguiſh it's parts plain as in a full grown-ear, and diſtinguiſh every ſeed to be of a watery pellucid ſubſtance; the grain being formed by the middle of April, the weather following ſeems to be of great conſequence.

It was obſerved this year, 1700, that wheat carried a very ſhort ear; for it had been a very wet cold May, and in that month, or near it, it was that the ear was formed, and, if the root be chilled in that month, it will not recover it.

The proverbial rhime holds not good on cold hill-country lands, tho' conſiſting of ſtrong clays, which yet is very true, when applied to Leiceſterſhire, and other deep lands warmly ſituated;

"I came to my wheat in May,
"And went ſorrowful away;
"I came to my wheat at [d] woodſheer,
"And went from thence with a good cheer.—

For, in cold hill-countries, whoever ſees not the ground well ſtocked with green wheat by the beginning of May, will never ſee a good crop.

Edge-grown corn on woodſeer ground.
* Spungy, ferny, poor.

§. 30. There is a ſort of land the country-people call *woodſeer ground; in this ſort of land, ſow early or late, the corn will be edge-grown, that is, much of the blade, after it is come up, will die away, and then ſpindle up again: this muſt be occaſioned by the root's being affected, and not only by the blade's receiving an injury, for then the blades of corn in the neighbouring grounds would be the ſame, as being expoſed to the ſame air; ſuch ground therefore muſt be ſuppoſed to be of a hollow ſpungy nature, very ſuſceptible of the air; and tho' it may ſeem to be cloſer and more compact than chalky land, yet really it is not ſo, elſe the chalky land would ſuffer the ſame fate. In theſe woodſeer grounds the roots of the corn are injured by the cold winds coming to them in March, April, and May, whereby they ſicken, and the blade preſently diſcovers it by dying away.

Of wheat's lodging, and the cauſe.

§. 31. The lodging of wheat is often occaſioned by a weakneſs in the ſtraw proceeding from the poverty of the land, it not being able to give nouriſhment, and ſo the ſtraw grows limber.—And in very ſtrong land the ſtraw of red-ſtraw-wheat will run to a greater luxuriancy in height than the ſtrength of the ſtraw will bear, and then it will lodge.

Of blights on wheat.

§. 32. This ſpring (anno 1720) being very cold and wet, and the ſummer by intervals rainy till harveſt, and oftentimes the rain falling with that weight as to beat down the beſt of the wheat in moſt parts, a month at leaſt, if not five weeks before harveſt, yet it did not, as uſual in ſuch caſe, blight, which was wondered at.—The reaſon ſeems to be, becauſe the ground by cloudy dark weather, and many repeated and frequent rains, was kept cool, and thereby it fed the corn, ſo that it did not ſcorch and burn as in other ſuch years, whereby the green corn that lodged, was not parched up; for it is obvious, it muſt burn and dry up more in hot ſcorching weather, when it lies flat on the ground, than ſtanding upright it would do; becauſe by ſtanding upright it ſhades the ground from the ſun.

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[d] The word woodſheer is underſtood for the froth, which, about the latter end of May begins to appear on the joints of plants, and is more commonly called cuckow-ſpit.

The country-man obſerves the blight to appear on his wheat quickly after it's bloſſoming-time, and ſo concludes the bloſſoming-time dangerous for blighting; and in all probability it may be ſo; for the blight perhaps ariſes from the cold winds condenſing the ſap and choaking up the pores of the ſtraw, whereby all nouriſhment that ſhould paſs to the ear is intercepted: but if this blight proceeds from a mildew falling from the air, as many people imagine, it cannot be ſo; for at the bloſſoming-time the ſtraw is not dry enough to receive and ſuck in ſuch mildew; it abounds with moiſture at that time, like green hay in ſwarth, and cannot be prejudiced by rain, as it may be after it is become hay, for then it imbibes the rain;—but, as I conceive, the blight appears not on the wheat till after the ſtraw becomes ſomewhat dry; tho' true it is, the mildew's lodging on the wheat at flowering-time, if not waſhed off by rain, may continue till the ſtraw be dry enough to imbibe it.—The poorer the land is, or the lighter it lies, tho' rich, the leſs able will it be to feed the roots of the corn ſo as to overcome the blight.—Now the reaſon why wheat or barley is ſuppoſed to be paſt blighting when the grain comes to ſome hardened pith, is, becauſe the mildew coming on the ſtraw then, it cannot affect the corn ſo as to blight it, it having by that time got ſuch a ſubſtance, as to be maintained by very little communication of ſap from the root, according to the degree of which the wheat will ſhrink more or leſs.—Perhaps the ſmut may be nothing elſe but the higheſt degree of blight, when the mildew comes ſo plentifully on the ſtraw as totally to interrupt and ſtop the riſing moiſture,—or when the particular bit of dung, or ſuch moiſture as lies to the root of the corn is, by that time the corn comes to kern, wholly conſumed by the heat of the ſun.

Obſerving the wheat-ears at bloſſoming-time, I found, that, at ſhooting forth the bloſſom, each cell or cheſt opens more than ordinary, and, when the flower is come forth, it cloſes again. This obſervation ſeems to account for the blight wheat is ſaid to take at bloſſoming-time, inaſmuch as at that time blighting winds and mildews are let into the cell where the grain is; theſe mildews whether they proceed from the air, and falling on the plant enter into it's pores, and prevent the ſap from filling it, or whether they are nothing more than the ſap itſelf, which, in it's paſſage thro' the pores of the plant, is checked and thickened by the cold winds, and being unable to fly off, ſettles on the ſurface, however this be, they are of that gummy nature, that they may eaſily be ſuppoſed to choak the grain.

Of BLIGHTING AIR.

[c] Country people look on hot glooms and a warm vapoury air to be blighting and to bring caterpillars and green locuſts; if ſo, this ſeems to be an argument for mildews falling from the air, and not proceeding merely from cold, for the reaſon thereof may be this; thoſe inſects eggs being laid on the leaves of trees and corn, the weather aforeſaid coming, which contains glutinous and unctious particles, may faſten thoſe eggs to the leaves and ſecure them from being blown away, till the ſun can bring them to perfection, whereas, if winds had come, or rains, inſtead of the aforeſaid blighting air, moſt of them might have been deſtroyed; ſo that ſuch glooms may well be ſuppoſed pernicious; and ſuch air may penetrate into the cells of the cheſts of wheat, and choak all circulation.—But on the other hand the mildew may proceed from the cold nights that give a ſudden check to the ſap, which had before been attenuated by theſe glooms.

If ſtrong winds come when the ſtraw of the wheat is grown a little ſtiff, i. e. about three weeks or a month before the corn be ripe, a blight often happens; for the ſtraw, being then ſtiffened, does not ply with the wind as when full of graſſy ſap, but by making reſiſtance it looſens the mores or fibres of the roots, which give way or break, as may be ſeen by the wheat's reclining at the root from the ſide the wind ſet till harveſt; whereby nouriſhment is not ſo well conveyed, and ſo the corn ſhrinks or blights, eſpecially in looſe ground, as it happened this year (1712) but, where wheat lay in a ſhelving ground, quite under the wind, no damage happened.

This year (1712) about the time the wheat was kerned, and juſt got into milk, or paſſing out of it into ſoft flour, there happened ſtrong weſterly winds, which ſtrained the roots of the corn, and made it recline; ſoon after which it was obſerved by the country-man, that the corn was generally ſtruck with a blight, eſpecially where the land was weak and light; for ſome of the fibres of the roots gave way, others broke, and the corn continued to lean from that point, from whence the wind came, till harveſt, but in very good land the corn ſuffered little by the blight. On my clay-lands, tho' the fibres of the roots were ſtrained, yet ſuch of them as were not prejudiced were able tolerably well, from the moiſture of the land, to feed the corn beyond what dry and light land could do:—However the ſtraw of all the wheat in the country looked white, and not ſtained with black ſpots.—The reaſon was, becauſe this blight proceeded not from the fat gummy-juices of the air, nor indeed from the coldneſs of the wind, (either of which may choak the vegetable juices and hinder them from aſcending through the ſtraw to the ear, whereby the corn may be ſtarved for want of nouriſhment), but from the ſtrength of the wind damaging and weakening the roots, which are the feeders of the grain, and preventing them from doing their office.—I had ſuch ground, which lay under a hill ſheltered from the wind, that was not hurt. All corn, on light and dry ground, ought to be cut ſooner than corn lying on a flat clay-ground, becauſe from the cold ground a damp ſteam will ariſe, and in ſome meaſure feed the corn that leans down more than it can be ſuppoſed to do from a poor dry ground, when the corn has loſt it's ſupport from the root.

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[c] Mr. Miller gives the following account of blights from the learned Dr. Hales, which in a great meaſure is agreeable to our author's ſentiments.—Blights are often cauſed by a continued dry eaſterly wind, for ſeveral days together, without intervention of ſhowers, or any morning-dew, by which the perſpiration in the tender bloſſoms is ſtopped: ſo that, in a ſhort time their colour is changed, and they wither and decay: and, if it ſo happens that there is a long continuance of the ſame weather, it equally affects the tender leaves; for their perſpiring matter is hereby thickened, and rendered glutinous, cloſely adhering to the ſurfaces of the leaves, and becomes a proper nutriment to thoſe ſmall inſects, which are always found preying upon the leaves and tender branches of fruit-trees, whenever this blight happens; but it is not theſe inſects which are the firſt cauſe of blights, as hath been imagined by ſome; tho' it muſt be allowed, that, whenever theſe inſects meet with ſuch a proper food, they multiply exceedingly.

The wheat leaſt liable to be hurt by theſe inſects, ſays Mr. Tull, is the white-cone (or bearded) wheat, which has it's ſtraw like a ruſh, not hollow, but full of pith, except near the lower part, and there it is very thick and ſtrong. It is probable it has ſap veſſels that lie deeper, ſo as the young inſects cannot totally deſtroy them, as they do in other wheat; for when the ſtraw has the black ſpots (which he calls the excrements of theſe young inſects) which ſhew that the inſects have been there bred, yet the grain is plump, when the grey-cone and lammas-wheat mixed with it are blighted.

Farmer Elton told me, that he had the ſtraw of his wheat grievouſly blighted, when the ears were not touched.—I told him, I thought that muſt be, becauſe the wheat was ſo near ripe that it no longer depended either on the root or the ſtraw for it's nouriſhment, and conſequently any defect in either of them could not affect the ear.—To which he aſſented, and ſaid, he believed it was the truth of the caſe.

§. 33. The worſe wheat is, tho' it be never ſo dry, it will handle the rougher; becauſe thin and coarſe wheat is not ſo plump and globular as fine wheat, and is often ſo coarſe as to be pitted, and wrinkled, which muſt needs make it leſs ſlippery.

Of wheat's handling rough.

§. 34. Wheat will handle colder out of a reek that is two years old than it will out of a reek of one year old;—for in that time, the miſts and rimes, eſpecially in the hill-country, will be drove into a reek.

Of wheat's handling cold.

§. 35. January (anno 1705) we had a month's ſeaſon of very wet and rimy-weather, in which time my bread proved very white, inſomuch as I was uneaſy about it: the miller ſaid, he ground the wheat as fine as uſual; the cook-maid ſaid, ſhe uſed the coarſe ſieve, as ſhe uſed to do: at laſt the miller ſaid, the reaſon muſt be the dampneſs of the weather, which made the wheat grind heavy, and not ſo fine, whereby the bran was the larger, and the flour the leſs.—From hence it appears, that wheat, which is heavy and cold, will not yield that flour that dry wheat will, nor conſequently that price, which is another diſadvantage beſides that of not keeping.

Heavy, cold wheat bad for grinding.

§. 36. Anno 1715 I obſerved in other perſons wheat as well as my own, it having been a wet harveſt, that moſt farmers had ſome wheat-corn grown, and that ſuch wheat would not yield ſo much by three-pence per buſhel as other corn that was not grown, and yet in ſuch grown-

Of wheat that is grown.

wheat it may be there was not to be found above a grain of grown-corn in two or three handfuls.— I thought it proper to demand the reaſon of the farmers, why ſo few grains of grown-corn in a large quantity of wheat ſhould make ſo great a difference in the price; at length farmer Iſles, of Holt in Wiltſhire, gave me the beſt reaſon:—he ſaid, where there is but a little grown-corn in wheat it makes a very ſenſible difference in the bread or pudding made of it; not that the grown-corn only, which is apparent to us, when ſo little, can make ſo great a difference, but wherever, ſaid he, ſo much corn is apparently grown to our eyes, a great deal more is damaged than appears to our eyes; for the flour of corn will be damaged and clammy, tho' it has not gone ſo far as to ſhoot either root or ſpear: it is enough to vitiate the flour if the nib or punctum ſaliens has ſwelled ſo as to crack or burſt the ſkin.—I told Mr. Raymond farmer Iſles's judgment of this matter, and he ſaid, it was a notable obſervation.

Rain coming before I could thatch a wheat-reek, one fourth part of the round being unthatched, the wheat there took damage by growing; and it is to be noted, that a little grown-corn will do a great deal of damage; 'tis not only the loſs of thoſe grains that actually grow, but a foulneſs and fuſtineſs alſo, and a ſmut that they beget in the germen, that rots the corn, ſo that ſuch ears will fly into duſt, like a puff, when they are ſtruck with the flail, and diſcolour the whole quantity of wheat threſhed with them, tho' it had otherwiſe taken no harm.—It is farmer Biggs's opinion, that it is the beſt to mingle all together, for the buyers will give nothing for the bad.——All my wheat of that reek alſo felt heavy and cold, tho' not one fourth part had taken damage; for the unthatched part taking damage, the damp that was thereby received, and pent in when it came to be thatched, did, it is probable,[e] ſtrike a chill to the whole reek.

Caution to ſell off old wheat that is coarſe before next harveſt.

§. 37. In caſe the ſpring be far ſpent, and the ſummer ſo advanced, that an early and forward harveſt may be expected, and the laſt year's wheat run coarſe, by reaſon of a cold ſpring and ſummer with a backward harveſt, it will be beſt to threſh out ſuch wheat, and ſell it before new wheat comes into the market; for the new wheat will carry ſo much better a body and colour, that the old wheat, when it ſtands in the market along with the new, will ſell to a much greater diſadvantage than it would have done, had it appeared by itſelf.

Antiquity of burning ſtubble.

§. 38. In Moſes's ſong on the overthrow of the Ægyptians, Exod. ch. 15. ver. 7. it is ſaid,—" Thou ſenteſt forth thy wrath, which conſumed them as " ſtubble,"—whereby it appeareth how antient a cuſtom it was to burn the ſtubble.—[f] Pliny takes notice that Virgil gives great commendation to the cuſtom of burning the ſtubble, but he himſelf thinks it of no other uſe but that of deſtroying the ſeeds of weeds.

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[f] Sunt qui accendant in arvo et ſtipulas, magno Virgilii præconio; ſumma autem ejus ratio ut herbarum ſemen exurant. Plin.

RYE.

§. 1. RYE is a grain ſeldom ſown in the counties I have been moſt converſant, and, as for my own experience, it has been very little in it.

Rye carried by the ſheep from one land to another.

Farmer Morrant of Eſſex aſſured me, that in their common-field one of the tenants one year ſowed rye in but two acres, and there was not that year one piece of wheat in the whole field clear from rye.—It was conjectured it muſt be the common-field ſheep croſſing over the two acres of rye, after it was ſowed, that carried it about in their claws.

Of ſowing rye in Leiceſterſhire.

§. 2. Mr. Putching of Leiceſterſhire informs me, that they ſow two buſhels of rye on an acre, which is as much as they ſow of wheat, becauſe, he ſays, tho' it is a thinner grain, and ſo more of it goes to a buſhel, yet it is alſo a tenderer grain, and therefore they give that allowance.---He ſays, in the common-fields in Leiceſterſhire they winter-feed their wheat by conſent, but they do not feed their rye, becauſe it is too tender to bear it, and the ſheep would make little holes with their feet in open weather, wherein the water would ſtand to the injury of the rye.

They never feed rye.

BARLEY.

Of rath-ripe barley.

§. 1. FARMER Biggs of Hampſhire tells me, he ſows much of the rath-ripe barley, that he ſows it on clay-ground, becauſe the fault of that land is that it's corn will be late ripe, which is mended by that barley: rath-ripe barley, he ſays, ought to be ſown early, or the corn will be thin; he ſows it in March. But farmer Elton, his neighbour, ſays, ſome ſow it firſt, and ſome the laſt of barley: he alſo ſays, it ought to be ſowed in good ſtrong ground, elſe it's ſtraw being very hollow will be weak, and ſo be beaten down and lodge.

It ſeems that rath-ripe barley ſhould be ſown on better ground than other barley, becauſe, ripening the ſooner, it may be ſuppoſed to exhauſt the goodneſs of the land, and to draw it's moiſture from it faſter than it can well give it, the corn coming to it's perfection in ſo much the leſs time.—But Mr. Raymond aſſures me, that with them, near Patney in Wiltſhire, they ſow it in the pooreſt ſandy ground.

Conformable to what Mr. Raymond had told me, a good farmer, and neighbour to both Biggs and Elton, is poſitive that on his poor gravelly ground it is much the beſt to ſow rath-ripe barley; for ſuch land will not hold out in feeding the late-ripe corn long enough, but will give off before it is ripe; therefore the rath-ripe barley does better, to ripen which there is not ſo much patience required; but quære how far this may hold alſo with white earth, which is the ſort of ſoil Bigg's and Elton's poorer land conſiſts of.

I ſowed this year (1707) rath-ripe barley in very poor white ground; I alſo ſowed the ſame in very good ſtrong clay-land: no rain fell to bring it up till June, and after that we had frequent ſhowers, and plenty of rain till harveſt, and in harveſt, and yet I obſerved my rath-ripe barley in the poor light land miſerably bent, broken in the ſtraw, and harled or fallen down: in the ſtrong clay-land it did the ſame, but not ſo much, tho' the ſtraw, and the leaf of the ſtraw was blighted, and full of black ſpecks, the ear thin, and it's colour loſt in all the rath-ripe barley, whereas the ſtraw of the late-ripe barley was both free from theſe ſpots, and ſtood upright with good ſtrength.--I do infer from hence, that, ſeeing the clay-land in our hill-country, tho' in good heart, and the moiſteſt ground we have, and in a moiſt year too, cannot ſufficiently feed the ſtraw of the rath-ripe barley, ſo as to enable it to ſtand upright, but ſuffers it to be languid and withering; I ſay, from hence I infer, that rath-ripe barley cannot be a proper ſort of barley for us to ſow; becauſe in our hill-country, where the ſtraw breaks or ſtarves three or four weeks before harveſt, it muſt needs be a thin coarſe grain; therefore in our hill-country it is beſt to ſow late-ripe barley, tho' we ſhould provide three or four horſes extraordinary againſt ſowing-time, in order to get the corn into the ground a week before May begins.

This year (1707) rain not falling to bring up the ſpring-corn till June, one half of the ſeed, that which fell deep, came up without rain, but the reſt not till rain came.—This gave me the opportunity of making the following obvious obſervation on the misfortune that rath-ripe barley is ſubject to in ſuch years, viz. that half that came up firſt, by reaſon of the weakneſs of the ſtraw of ſuch barley (as above ſet forth) could not wait for the ripening of the latter edge-grown corn in the ſame field; but it's ſtraw bent, broke, and harled, and the ears buried themſelves among the broad-clover ſown with the barley, ſo that I was forced to cut it, not being able to ſtay a week or ten days longer for the edge-grown corn to ripen; whereas, the late-ripe barley ſtood ſo upright in it's ſtraw, that the corn, which firſt came up, would ſtay ten days for the edge-grown corn.

In May, (anno 1702) I aſked Mr. Raymond whether he was not of opinion that rath-ripe barley, by reaſon of the weakneſs of it's ſtraw, was often apt to fall down to the ground, juſt when ready to mow. He replied, with them they had no ſtones, ſo that was no hindrance, unleſs by the bending down of the ears the ſcythe might cut off ſome of the ends of them, which miſchief he had not obſerved to be more in that ſort of barley than any other; —but that in rath-ripe barley there is this miſchief, ſaid he, we hold, viz. if the ground be good, and the year a feeding year, rath-ripe barley is apt to run rank, and to fall whilſt very green in ear, which occaſions the grain not to fill, and is the greater miſchief; therefore, ſaid he, this year I ſowed common barley; but ſuch a hot dry ſpring as this there can be no danger.

It was very manifeſt to me, this year (1706), that the ſtraw of the early-ripe barley is thinner and weaker than that of the late ripe barley; for all my rath-ripe barley (of which I ſowed fifty acres in different ſorts of ground, and ſome of it ſide by ſide with the late-ripe barley) did crumple down in the ſtraw, when the late-ripe barley of the ſame forwardneſs and growth ſtood upright; and this year I alſo obſerved in all my rath-ripe barley, that the grain was thinner than that of the late-ripe, which I impute to the dry ſcorching ſummer; the ſtraw, being thinner and weaker, was leſs juicy (as we find by giving it to cattle) and ſooner dryed up, and the want of nouriſhment ſooner appeared in that ſort of barley;—but farmer Biggs ſays, that in wet ſummers he uſually obſerves the rath-ripe barley to be the fulleſt bodied corn.

It ſeems plain to me, that rath-ripe barley, as it ſhould be ſown early, for reaſons before ſet forth, ſo it ought not to be expoſed to the north, but ought likewiſe to be ſown in pretty good ground, either by nature, or made ſo by art; for we know, the poorer the ground is the weaker and poorer the ſtraw will be in all ſorts of corn; and if the rath-ripe barley has by nature a weaker and thinner ſtraw than the late-ripe barley has, and on that account is apter to crumple, to bend down, and to break in the ſtraw before it is ripe, much more will it be apt to do ſo, when the ſtraw is made much thinner and weaker than naturally it would be, by the poverty of the ground it is ſown in.

It is very evident to me this year (1720), that rath-ripe barley ought not to be ſown on poor ground, and much leſs ſo, in caſe it lie declivous from the ſun towards the north.

Of middle-ripe barley.

§. 2. An experienced farmer of Somerſetſhire very much perſuades me, that the middle-ripe barley would be the beſt I could ſow at Crux-Eaſton, and that I ſhould thereby avoid the inconveniencies incident to rath-ripe barley; viz. that of crumpling and falling down, or being knee-bent, and that of the thinneſs of the grain, from thence ariſing; for if by much wet it falls down too long before it be ripe, the barley will thereby be ſtunted, and will ſhrivel and ſhrink; for no nouriſhment paſſes after the breaking or bending of the ſtraw; but this middle-ripe barley, ſaid he, will ſtand upright till harveſt, and then the ſtraw makes better fodder than the other.—I replied, I had tried it, having bought it for ſeed, in our neighbourhood, but found no ſucceſs.—He ſaid, he did not wonder at that, for he had done the ſame; but, ſaid he, you muſt buy it from about Bemerton, near Saliſbury; in that caſe I found it quite another thing: buy a load yearly to keep up change.

It was very evident to me, after I had ſowed middle-ripe barley, that the corn which grew on that part of the ground declivous from the ſun did not ripen ſo ſoon, nor ſtand ſo long upright as the reſt, but in many places fell down flat into the graſs; ſo that middle-ripe barley, tho' it better bears late ſowing, even on a ground declivous from the ſun, than rath-ripe barley, yet it will neither bear the one nor the other ſo well as late-ripe barley will do, nor will it's ſtalk ſtand ſo long.

It is obſervable that the middle-ripe barley aboveſaid, which was ſown at the bottom of the field, lying on a flat, ripened altogether, and looked white and very * ſuant, being forwarder than that part of the ground which lay on the ſide of a hill declivous to the ſun; but again, four or five luggs wide, in the bottom between the hills, it ripened as ſoon, and looked as white and ſuant

* kindly, flouriſhing.

ſuant as in the abovementioned bottom that lay open to the ſun and air; but on the ſide of that hill that ſloped from the ſun the corn was more edge-grown, and lay backward, and neither looked ſo white, nor was ſo ripe. This ſhews that a bottom ground, or a vale pent in between two hills, tho' ſhaded by one from the ſun; yet, by means of the warmth and cloſeneſs of the air, will many times ripen as faſt as a ground lying declivous to the ſun.

Of the nature of rath and late-ripe barley.

§. 3. It does not ſeem very eaſy to make a conjecture of the nature of late-ripe and rath-ripe barley, and to give reaſons why the late-ripe agrees beſt with cold, and the early-ripe with hot grounds, and with a hotter climate; but I ſhall venture however to deliver my notion of the matter. I conceive the reaſon why one ſort of grain is late-ripe, another rath or early-ripe, is from the ſtamina and conſtituent parts of each grain, which in the rath-ripe ſort are of a looſer and opener texture in the fiſtular parts and glands. The rath-ripe barley having finiſhed it's courſe, and come to a maturity in leſs time by being committed to a warm bed, ſhews the veſſels of the ſeed to be leſs compact, and the fibres and ligatures not ſo well ſtrung, and their tones looſer than thoſe of the late-ripe; for the quicker the growth of the ſolids are, in animals as well as plants, the parts which contribute towards ſuch growth and increaſe are leſs ſolid and compact, as carrying with them a greater mixture of fluids, which are the neceſſary medium for conſolidating the harder or drier particles, which united make the ſolids, and therefore, the cement being of a looſer ſubſtance, no wonder if the fibres of ſuch ſeeds are ſo too: thus the parts of the rath-ripe ſeeds are not corded, braced, or faggotted together with ſo ſtrong an union or texture as the late-ripe ſeeds, which laſt being ſowed in cold ground, and in a cold clime, the vegetable juices are ſent up in leſs plenty, and the particles that contribute to the ſolids are not over-flowed with ſo liberal a quantity of fluids, which are therefore the firmer maturated and digeſted; from hence it muſt follow, that the paſſages of the fibres and glands in ſuch ſeeds are ſtreighter, and the juices are longer in filtrating through them; from whence it muſt appear (which is the queſtion in hand) how the late-ripe ſeeds agree beſt with a cold clime, and cold ground, and the rath-ripe ſeeds with a warm clime, and warm ground; for the ſtamina of the late-ripe ſeeds are cloſer, harder, and more compact, and there is a ſtated time for every diſtinct progreſſion in vegetation. The Rei ruſticæ ſcriptores tell us,—that after ſo many days each ſort of corn puts forth ſo many leaves, then has ſuch a ſtated time for flowering, and ſuch from thence for finiſhing the ſeed, and ſuch for ripening it: ſo, agreeable to the conſtituent parts of the ſeed, through which the vegetable juices are to paſs, there is ſuch a ſtated time to be completed in each ſtation and progreſſion, before nature can rightly finiſh one work, in order to another, till the end of her intention is anſwered, viz. that ſeeds of increaſe are produced from a ſeed.—From hence it follows, that colder earth, and a colder air anſwer the nature of late-ripe ſeed better, becauſe the vegetable juices are not forced up the plant in a more furious manner than the veſſels can receive them, or go hand in hand with them in growth; for the fibres and fiſtular parts of a plant, or a fruit, are to proceed gradually in extenſion of parts, as well as in fulneſs of juices, and there ought to be ſuch an increaſe of juices as is proportionably adapted to the extenſion of the fibres, that one work of nature may not outrun the other; for if the heat of the ground, or the air, haſtens the juices of the ears of late-ripe barley to maturity faſter than the fibres of the grain (being of a harder texture) will be extended, or admit of extenſion, it follows that ſuch grain will not arrive to it's perfection, or full growth, but muſt dry and harden before it is come to it's full body.—So, on the contrary, in rath-ripe barley (in which the fibres are looſe, and conſequently by nature diſpoſed to a ſpeedier extenſion) in caſe the ground it is ſowed in be cold, the fibres of the ſeed of increaſe will run on faſter in extenſion, and ſo to maturity or hardneſs, than the cold juices of cold land, in a cold air, will aſcend to plim and plump up the ſeed, and from this ill match or marriage muſt ariſe a leanneſs of ſeed in the increaſe.

By what has been ſaid of the properties of late-ripe barley, it is evident, that, if it be edge-grown, the ears that are firſt ripe will better wait for thoſe which lye behind, or are greeniſh, than the forwardeſt ears of rath-ripe barley can do; for that will fall down, and be * more-looſe, if you delay the cutting of it when ripe.

* looſe at root.

It ſeemeth to me from the experience I have made, that late-ripe barley will better endure to be ſowed when the ground is wet than rath-ripe barley will do; the reaſon of which I take to be, becauſe the late-ripe barley is (as all other late-ripe ſeeds of the ſame kind are) cloſer in it's texture, and more compact in it's parts, and conſequently more reſiſts moiſture than the rath-ripe barley does, which is opener and looſer in it's parts, and conſequently drinks in moiſture more freely, and is ſooner chilled thereby, or made drunk therewith, and ſo it burſts.

Of ſprat or battle-door barley.

§. 4. Mr. Clerk of Leiceſterſhire informed me, that ſprat or battle-door barley required a ſtrong good land, that it's peculiar property was, that it would not run up to a length of ſtraw, tho' in good land, ſo as to lodge, as other barley would, and that it had a ſtronger and more pithy ſtraw, but not ſo good for fodder.

Mr. Ray, fo. 1243, ſpeaking of battle-door or ſprat-barley, ſays, it is thought to be more ſafe than other barley from the depredations of birds, becauſe it's grains are more difficult to be torn from the ear than the grains of other barley.

J. Mortimer, Eſq; F. R. S. fo. 100,—the ſprat, or Fulham-barley is the beſt for rank land, becauſe it doth not run ſo much to ſtraw as the common ſort, and yields much better.

Mr. Johnſon of Bedfordſhire, of whoſe judgment I have a great opinion, after he had ſown great-wheat in a new broken-up very rich paſture-ground (which ſort of wheat he choſe, becauſe it was the leaſt ſubject of any to lodge) and the next year had ſown beans, the year following, being the third year of ſowing the ground, took me with him to view it, in order to adviſe with me what grain he ſhould ſow: he thought it would be too rank for barley, becauſe that is more apt to lodge than oats, and alſo too rank for oats, and was therefore inclinable either to ſow great-wheat and red-ſtraw-wheat mixed, that the former might help to ſupport the latter from lodging and falling, it being a rank ground, or elſe to ſow red-ſtraw-wheat alone, becauſe, next to great-wheat, that ſupported itſelf the beſt.—I have known great-wheat and red-ſtraw-wheat often ſowed in the north, in good land, for the ſame reaſon.—I agreed with his reaſons, as being good, but told him, I ſhould rather recommend battle-door or ſprat-barley, if he would ſend for it from beyond London, it being not only a ſhorter, but alſo a ſtronger ſtrawed barley than any in the north, and therefore fitter to ſow on rich land, in order to prevent lodging, and was alſo good to mix with other barley, to help to ſupport it.

§. 5. Mr. Ray, ſpeaking of the ſquare-barley, or winter-barley, called alſo big, ſays, it is commonly ſown in the mountainous parts of northern countries, where other kinds of barley will not bear the winter; but this ſort is not hurt by the froſt.

Of ſquare-barley or barley-big.

The ſix-ſquare barley, vulgarly called barley-big, is ſowed in Leiceſterſhire in ſmall quantities, but, tho' it is a great increaſer, they told me they did not like it, becauſe it was not good for malting, it had ſo thick a rind.—Mr. Glen of Hawthorne ſaid, to ſow a little of it for poultry did very well; but, ſaid he, for the moſt part they ſow it in Northumberland, and ſo far northward, becauſe it will endure the winter, whereas the lenten-barley will hardly ripen with them.

Rich land makes barley thin.

§. 6. Farmer Elton having been at Major Liver's to buy barley for malting, I aſked him if he could deal, he ſaid, the Major had good barley, but, having rented the parſonage of Huſborne for ſix or ſeven years, he had ſo much bettered his own ground, that his barley was apt to run out too far in length and be thin. I aſked whether the richer the land the thinner the barley. He ſaid, yes, if the ground be not thick and full ſeeded.

The thin-rinded barley not owing to the richneſs of the land.

§. 7. Mr. Smith of Stanton aſſured me, that eminent malſters, whom he named, had told him, that the boldeſt barley and the beſt bodied for malting came off of the ſtrongeſt land.—I ſuppoſe their meaning was, where the land lay both very dry and healthy; not land of a cold clayey nature, but ſuch that had mellowneſs and lightneſs with it's ſtrength, ſuch as the Leiceſterſhire and Northamptonſhire-lands are, and ſuch as the land is about Biſhop-cannons in Wilts: what Mr. Smith ſaid was on account of the preference generally given to hill-country-barley, which, as I take it, depends on this diſtinction, viz the hill-country-barley is generally better eſteemed by the malſters than the vale-barley; becauſe the hill-lands are often dry and mellow, as well as of good ſtrength, but the vale-lands are generally too wet, cold, and clayey; inſtead of which, did the vale-lands exceed the hill-lands in ſtrength, and yet were of a mellow and dry mold, no doubt ſuch vale-land would bring the beſt bodied-barley.—I ſpeak this to ſhew, that poverty is no ingredient requiſite in land, for carrying a plump and fine rinded barley; yet it is true, that poor land, lying dry and warm, muſt be allowed to bear better barley than rich land that lies wet and cold; for barley does not ſtand ſo much in need of ſtrength in land as of the healthineſs and warmneſs of the ſoil, tho' both are beſt, where they can be had.

Of barley's degenerating.

§. 8. [g] Upon obſervations made on my barley this year (1711) after I had threſhed ſome of different ſorts, viz. that which was earlieſt, middlemoſt, and laſt ſown, all of my own ſeed, as alſo barley from ſeed bought of Mr. Cox of Weſtover, I plainly ſee the reaſon why barley ſown on our hills, from year to year, of our own ſeed, without changing, muſt in time ſo degenerate, as not only to produce a very thick-rinded, and cold glewiſh-floured barley, but as ſmall alſo as a black oat: wherefore Crux-Eaſton being cold both in it's lands and it's ſituation, is neceſſitated to be ſown later, and the ground not forwarding the corn in growth, as warmer lands do, the harveſt muſt be later, all which contribute to the producing a thick rinded, and cold floured barley: barley, being tender in nature, requires a warm ſoil and clime.—Now if you will ſow the ſeed-barley produced from ſuch a place, being coarſe, thick-rinded, and cold in flour, it will require more days to root and ſpear in than the bought ſeed it proceeded from, which came from a warm land, and will alſo ſtrike leſs bold roots to forward the grain towards maturity in the courſe of vegetation; from whence it is manifeſt it will ſtill come to a later harveſt, and conſequently be every year coarſer, and every year proportionably degenerate.—As for wheat and oats, they are hardier grains, and will bear ſowing early in cold land, and ſo come to maturity in good time, and therefore will not ſo ſoon degenerate, tho' the ſeed ſhould not be ſo often changed.

As I have taken notice of barley's degenerating, and becoming coarſer and coarſer every year, by reaſon of it's being longer in coming up, ſo without doubt in ſuch coarſe barley the nib or germen, and all it's parts, even the ſeed of the ſeed is coarſer in it's texture.

Caution—to ſow good ſeed.

§. 9. Anno 1699, after barley-ſeed-time there was for about a month a very dry ſeaſon, ſo that but very little barley came up, and, except rain came, it was very likely the whole crop might be loſt, and, in caſe a very wet ſeaſon had come, it had been the ſame; from whence I obſerve of what great conſequence it is to put very good ſeed into the ground; for without doubt ſuch ſeed will better endure all ſorts of extremities of weather than bad ſeed can do.

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[g] Mr. Tull, in his chapter of the Change of individuals, ſays,—Seeds in their natural climate do not degenerate, unleſs culture has improved them, and then, upon omiſſion of that culture, they return to their firſt natural ſtate. He argues in this chapter, that the reaſon why individuals of all kinds of grain, as wheat, barley, and vegetables in general, degenerate, is owing to the effects of different climates, as heat, moiſture, &c. and inſtances, that flax-ſeed brought from Holland, and ſown here, will bring as fine flax as there, but the very next generation of it coarſer, and ſo, degenerating gradually, after two or three deſcents becomes no better than the common ordinary ſort;—that common barley, ſown once in the burning ſand, at Patney in Wiltſhire, will, for many years after, if ſown on indifferent warm ground, be ripe two or three weeks ſooner than any other, and is called rath-ripe barley; but if ſown a degree farther north, on cold clayey land, will in two or three years loſe this quality, and become as late ripe as any other. Note, he has no great opinion of this barley, as being of a more tender ſort, and thinner bodied than the late-ripe, and not recovering a check from cold or drought ſo ſoon as the other.—Weeds, acorns, hips, haws, &c. ſays he, are thought to have been originally the only natural product of our climate: therefore other plants, being exotics, many of them, as to their individuals, require culture and change of ſoil, without which they are liable, more or leſs, to degenerate.

Experiment to ſhew the advantage of ſowing full-bodied good ſeed.

§. 10. About the middle of April (anno 1705) I ſowed twenty-ſix acres of barley with ſeed that came out of an unhealthy cold ground, that uſually run very thin; ſo that, however ſuitable the change of the ground might be, I doubted whether ſo thin a grain as moſt of this was could be ſo profitable as a fuller bodied grain.—To try the experiment, I took ſixty grains of this corn, of three different ſizes, viz. twenty grains of the biggeſt, twenty of the middle ſize, and twenty of the ſmalleſt corns: I put the twenty of each ſort into three ſeveral pots, with rich mold of the ſame ſort in each pot: in eight or nine days time I found thirteen of the fuller bodied corns were come up, nine of the middle-ſized, and but five of the ſmalleſt; but the fulleſt bodied corn, both in colour and breadth of blade, exceeded either, and both the other ſorts.—In three days after I found nineteen blades of the biggeſt ſort come up, ſeventeen of the middle ſize, and thirteen of the leaſt: in three days after the twenty blades of the beſt and the middle ſort were all come up, but of the worſt only ſeventeen blades; but as theſe blades of the worſt ſort carried a manifeſt diſadvantage in colour and breadth, and doubtleſs many of them would never have come up at all in poor ground, tho' the better ſort might all have grown, ſo I queſtion not but I ſhall find the ſame diſproportion in all the tillows, ears, and body of the grain.

Of ſowing graſs-ſeed with barley.

§. 11. If you ſow rye-graſs, or French-graſs with barley, it is to leſs purpoſe to be curious in your barley-ſeed: when you ſow graſs-ſeed with barley, it matters not if there be any trumpery of oats, &c. in it.

Caution—not to buy barley-ſeed till near ſowing-time.

§. 12. At Chriſtmaſs-time (anno 1700) ſeveral good farmers being with me, I was enquiring for peas and barley for ſeed.—They replied, that the houſing of corn had been ſo good this year, the buying of ſeed might be ventured on the earlier, elſe they uſed not generally to buy their ſeed-barley, nor ſeed-oats, but juſt before ſowing-time, leſt they ſhould ſmell by heating, and ſo not grow.

Of ſowing malted corn.

§. 13. Mr. Thomſon, malſter, aſſured me, that after barley is malted, and the coome and duſt taken away by ſcreening it, and ſome time after paſt, the malt will grow; for, ſaid he, I have ſowed it in my garden; but it will come to nothing; from which I conclude, firſt, the great conſequence of the flour in corn, to ſtrengthen the root, and to nouriſh the grain in flinging out good roots, which in the malt is ſpent and waſted before it is laid in the ground; ſecondly, I infer from hence, that the ſeeds of many weeds, after they have lain ſome time in the dung-hill, may grow, tho' thereby malted.

Farmer Bond aſſures me, that Mr. Edmunds, the receiver of my Hampſhire-rents (being a malſter) having taken lands in the beginning of May, and no barley being to be had, he, by the perſuaſion of his malting-ſervant, made uſe of barley he had wetted, and was juſt well chitted or ſprouted; he ſays, he ſaw the crop, and it came up very well, and was as good corn as any he ſaw that year (1703).—So that it ſeems to me, barley a little forwarded by the malſter may be good to ſow, though malt throughly made is ſtark naught.

Cook, the gardener, fo. 9.--I do adviſe my country-men, if late in ſowing any of their grains, eſpecially barley and wheat, to ſteep them; if your grain be ſpeared, it is never the worſe, provided you ſow it before the ſpear be chilled or dried.

The marks of good barley.

§. 14. It is agreed, that is the beſt ſort of barley, that is not blackiſh at the tail, nor has a deep redneſs, but is of a pale lively yellow colour, with a bright whitiſhneſs in it, and if the rind is a little curdled, ſo much the better.

Cauſe of curdled-rinded barley.

§. 15. It is ſaid, that the curdled-rinded barley is the finer ſort, and has the thinner coat.—Being in the barn, and handling both the ſmooth-coated barley and the curdled-coated, I perceived the reaſon thereof; for if barley comes to ſweat in the mow, and to dry, if it be thin-coated, it will curdle, but the rind of thick-coated barley, being ſtiff, will not ſhrink, but will lie ſmooth and hollow, tho' the inſide flour ſhrinks from it.

Barley, at firſt coming up, of a paler colour on cold land.

§. 16. The 2d of May (anno 1720) farmer Sartain went out into the fields with me, and on viewing three or four fields of barley, which had been come up about a fortnight, he obſerved, that the barley of their country, i. e. north Wiltſhire, came up with a ſtronger green colour, and did not look ſo pale or yellow as in our country, of which I am alſo very ſenſible, and do judge it proceeds more from the coldneſs of the land and country, in the firſt ſown barley, than from the poverty of the ground; becauſe ſuch manifeſt difference will not be at the firſt coming up of the latter ſown corn of our hill-country, nor will ſo great a difference appear between our barley and their's by that time June comes.

To know when barley is ripe for cutting.

§. 17. When barley is ripe, it will double and bend down it's head; at the ſame time you'll find ſome ears to ſtand upright, tho' the grain may ſeem full hard and dry, but the ſtraw of ſuch ears, eſpecially at the knots, will be greeniſh, and will therefore be apt to heat in the mow.

Of the number of grains in an ear.

§. 18. Mr. Ray, fo. 1243, ſpeaking of barley-ears, ſays, they ſometimes contain twenty grains in each row.—Note,--I never yet ſaw above ſeventeen or eighteen.

Showers before harveſt make the rind fine.

§. 19. This year (1706) not only in Hampſhire and Wiltſhire (where I ſaw abundance of corn, and had good intelligence from others) but alſo in Banbury-market (where I ſaw the ſacks of corn) as well as in Leiceſterſhire, and by account from Mr. Clerk, in all the counties northward, the barley carried a coarſe and thick rind.—For three months before harveſt no rain fell; ſo it ſeems, that ſome ſhowers before harveſt are uſeful to make the rind fine.

Knee-bent barley—it does not mow well.

§. 20. The barley this year (1702) was knee-bent, and would not therefore mow well; for in ſuch caſe, it being looſe in the ground, the ſcythe, inſtead of cutting, carries the ſtraw away with it root and all, which deadens the ſcythe's cutting what is farther on before it.—This proceeded from the dry ſummer, whereby the earth being looſe, it looſened the roots of the barley, and conſequently the grain could not fill.—I obſerved what they call knee-bent, and that the ſtalk was bent from the root in the manner of a bow or hollow for two or three joints, like leaning on the ground, which muſt ariſe from the corn's falling by being looſe, and then it riſes upwards again from upwards of half the ſtraw, toward heaven, as all trees and plants do that fall along; their ſhoots will ſtill ariſe perpendicularly, and this occaſions the bow in the ſtraw, which is called knee-bent.

When the barley (as above deſcribed) is knee-bent, in ſuch years, by the breaking and bending of the ſtraw, not only the grain is much thinner and coarſer, by having it's nouriſhment intercepted, but the ſtraw alſo is, for the ſame reaſon, much poorer, becauſe by thoſe breakings and bendings the juices are ſtopt from riſing: ſuch years you muſt expect great waſte to be made in the ſtraw; the cattle by refuſing much of it will make oughts; and in ſuch cold wet years, in the cold clay-hill country, the barley is apt to look reddiſh and ſtained at the germinating or ſprouting end.—I would adviſe all huſband-men to avoid ſowing ſuch barley, eſpecially in cold land, for, tho' it be not dead, 'tis too much like it, and will come away very untowardly in malting, much of it lying behind on the malting-floor, and, ſhould it come away no better when ſown, it would be edge-grown, and as very many grains of ſuch barley will never make malt, ſo neither can they be fit for ſeed.

Of hares biting off barley.

§. 21. July 20th (1704) I obſerved many full grown ears of barley lying along in a tract in the field, and withered, which ſeemed to be a great ſpoil; I took them up, and found the hares had bit off the ſtraws at the ground, to make a more convenient track.

Of worms eating barley.

§. 22. The ſame day I obſerved ſeveral grains of barley, almoſt ripe in the ears, to have worm-holes in the out-ſide, like thoſe in nut-ſhells; the flour of theſe grains was eaten up.

I have obſerved that a worm is blown by ſome fly in the ſpring underneath the barley-ear, when young in graſs; I do not ſuppoſe however the ſame happens to wheat, that having endured the winter, and being coarſer to their tooth; but I ſuppoſe the ſame thing may happen in black oats.

Of edge-grown barley.

§. 23. Edge-grown barley (i. e. ſuch as is not full ripe with the reſt, tho' all cut together) is very diſcernable, tho' it ſhould dry in the ſwarth never ſo well; for ſuch edge-grown barley, when threſhed, will look of a horn colour, and have a ſleek ſmooth white coat like good wheat, but it will ſtand hollow from the flour, becauſe that, being pulpy, is ſhrunk away from the coat.

Of burnt barley—worm eaten.

§. 24. Auguſt the 15th (anno 1703) I obſerved much burnt barley, and opening the black grains I found a maggot in many of the wholeſt of them, where the grain ſeemed to be preſerved ſomewhat intire; the maggot lay towards the top of the corn, was of a bluiſh colour, and had little legs to crawl with.—I ſuppoſe the other grains in the burnt ear might have had maggots too, but they being moldered away, the maggots were gone.—And yet it is ſtrange that burnt corn ſhould proceed from this maggot blown by a fly, ſeeing in burnt corn of all ſorts every grain in the ear is burnt, and ſo is the ear of every ſpindle from the ſame root, and the ear is burnt before it gets out of the hoſe;—and yet it is ſtrange a fly ſhould chooſe a ſooty burnt place as a fit matrix to lay her flie-blow in.—Quære of this earlier in the year.

Of mow-burnt barley.

§. 25. If corn come into the barn greeniſh, and is trod in the mow, it will be mow-burnt; for which reaſon it ſhould be laid light and eaſy.—The inconveniency of mow-burnt barley is very great, for it will neither make malt, nor will the hogs eat it freely.—It is as bitter as ſoot, and when the malſters bite it, it is as red as a fox within-ſide, and if you ſell a parcel of it to a malſter, tho' at a low price, he will never come again.

Airineſs therefore is convenient to a barn, to keep the corn from heating, for, if it be haſtily brought in, as it often muſt be, and before it is full dry, it will through heat be parched, and ſometimes ſet on fire: this heat will make the barley red at one end, ſo that it will never come in malting, and a reek in the barn will often be ſo hot that there is no enduring to be upon it.—Farmer Elton once thought that he ſhould have had a reek of barley fired in the barn by heat, and he was forced to cut a great hole down to the bottom of it, but could never ſtay at it above a quarter of an hour at a time for fear of being overcome by the heat.—It is barley and oats that are chiefly ſubject to heat, becauſe the undried-weeds are brought in with them, whereas there are not ſo many weeds among wheat.

OATS.

Why oats impoveriſh land.

§. 1.[a] A Farmer dining with me, I was giving the reaſon why oats impoveriſhed the ground beyond other grain, and ſaid, that it was not only becauſe the farmer generally ſowed oats, when the land would bear nothing elſe, and ſo it being the laſt grain ſowed, he was apt to impute the following poverty of the ground to that only, but that grain is commonly ſown on one earth, and conſequently does not fall ſo deep into the ground as corn ſown on two or three earths, and therefore oats prey more upon the goodneſs of the land, than any other corn; for they eat up all the fatneſs that the ſun, dew, or rain give to the ſurface of the ground, they lying ſo ſhallow, and for the ſame reaſon ground will bear oats that can bear nothing elſe; that grain lying ſo ſhallow lives on the nouriſhment the ſun, rain, and dews daily adminiſter.—And the farmer added, that a load of oats in the ſtraw was heavier than a load of any other corn in the ſtraw, and may therefore exhauſt the ground more,—and note further, the increaſe of oats is greater than of any other grain.

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[a] Mr. Miller, in his Gardener's Dictionary, reckons four ſpecies of oats, viz. common or white oats,—black oats,—naked oats,—and red or brown oats.—The firſt ſort here mentioned, ſays he, is the moſt common about London: the ſecond ſort is more cultivated in the northern parts of England, and is eſteemed a very hearty food for horſes: but the firſt makes the whiteſt meal, and is chiefly cultivated where the inhabitants live much upon oat-cakes.—The third ſort is leſs common than either of the other, eſpecially in the ſouthern parts of England; but in the north of England, Scotland, and Wales, it is cultivated in plenty. This ſort is eſteemed, becauſe the grain threſhes clean out of the huſk, and need not be carried to the mill, to be made into oat-meal or griſt. An acre of ground does not yield ſo many buſhels of theſe as of the common oats, by reaſon the grain is ſmall and naked, and goes near in meaſure; but what is wanting in the meaſure is ſupplied in value.—The red oats are much cultivated in Derbyſhire, Staffordſhire, and Cheſhire, but are never ſeen in any of the counties near London; tho', as they are a very hardy ſort, and give a good increaſe, they would be well worth propagating, eſpecially in all ſtrong lands.—The ſtraw of theſe oats is of a browniſh red colour, as is alſo the grain, which is very full and heavy, and eſteemed better food for horſes than either of the former ſorts.—Our author ſpeaks nothing of the naked, or of the red oats, but only of white and black, excepting that he mentions the Poland ſort, which is alſo a white oat, and of a ſhorter grain than the common.

Of the burning quality of oats.

Virgil, and the Romans who wrote of agriculture, often uſe *uro* for *emacio*; (as, *urit avena*) yet we find fire in all caſes enriches the earth: but the old ſignification of *uro* was alſo *to chill.* And cold is analogous to burning, as having the ſame effect, which we ſee by it's withering up leaves.

Of the roots of oats.

§. 2. April 30th (anno 1705) I firſt obſerved, that from the oat many rooted-fibres ſhoot forth, and the ſtalk that riſes upward takes new root again on the ſurface of the ground, at a certain diſtance from the firſt root, according to the depth the oat lies in the ground, ſo that the oat has two ranges or tires of roots; no wonder then that oats ſhould draw off the nouriſhment of the earth more than barley.

White oats require fat ground.

§. 3. According to the beſt obſervations I can make, white oats require a fat and feeding ground; for the halm, or ſtraw running to a great largeneſs cannot be ſupported without good juices and moiſture; I have alſo obſerved, that white chalky ground, tho' in never ſo good heart, will be unfruitful with white oats; nor will a mixed mold, between white earth and red clay, of which we have a great deal in our hill-country, be feeding enough for them: our red clays, and white clays, when in good heart, carry moiſture enough, and are very fit for that grain.—It ſeems to me, that white oats may be ſowed when the ground is moiſter than barley will endure it to be, becauſe barley, having a thinner coat, is ſooner chilled by quick imbibing the wet, and many of it's veſſels may perhaps burſt, whereas white oats reſiſt the entering of the moiſture; they, having a double hull, are protected, and cannot ſo ſoon be drowned.

White oats yield better than black.

§. 4. I took in a reek of black oats of thirty-eight loads, and a reek of white oats of twenty-eight loads, and, when they were threſhed, I found the reek of white oats yielded more than the reek of black oats, of which I ſpoke to ſome farmers; they all agreed, that white oats always yielded better than black oats, and ſaid, that an ordinary crop of white oats was accounted as good as a good middling crop of black oats.

White oats ſaid to ſpring again from the old roots.

§. 5. Anno 1703, having ſowed white oats they proved blighted, but, as I thought, none had britted; yet in November I ſaw a multitude of oats ſpringing up very thick; I ſeemed concerned, as thinking I had had a great loſs by the ſhattering,—but an old huſbandman ſaid, it was the nature of white oats, when cut, to ſpring up again from the old root, but they would die away when the froſts came, but that black oats would not ſhoot forth blades from the old root.--Some time after I dug up many of them, and found no ſuch matter, but there was an oat-hull at the root of all of them.

Farmer Wey, and farmer Farthing of the Iſle of Wight told me, that they, and ſeveral other farmers in the Iſland had cut oats this ſummer (anno 1707) which came from the roots of the laſt year's oats, and had ſhot roots, and tillowed from thence notably, and yielded very good crops; but, that I might not be miſtaken, I aſked them over again, if it was not from the brittings of the laſt year's oats; but I found they were well acquainted with a baſtard-crop of oats; and they both ſaid, that they had pulled up the ſtubble, and it appeared plain that they were iſſues from the roots of the laſt year's ſtubble.

§. 6. In dry cold ſprings, and hot ſummers following, black oats ſowed on lay-ground, tho' clay-land and rotten, will be as ſubject to blight as winter-vetches ſowed in ſuch lay-ground, as it happened to both anno 1714.

Black oats liable to blight ſowed on lay-ground in cold dry ſprings.

§. 7. Anno 1709; in ſome of my wheaten-ground ploughed up this year, becauſe the wheat was killed by the hard winter, I ſowed, in the beginning of May, in part of it rath-ripe barley, and in part of it a white Poland-oat: both grains were put into a ground of equal fertility and moiſture, and on the ſame day.—I doubted not but the Poland-oat would be firſt ripe, and was therefore ſurprized to ſee the rath-ripe barley come up four or five days before the oats; I obſerved alſo in other grounds ſowed the ſame day the barley to do the ſame.—I ſoon concluded the reaſon to be, that the oat having a double hull, and ſo better guarded from moiſture, could not ſo ſoon imbibe the vegetable water as the thin-rinded barley could, though doubtleſs the texture of the flour of the oat, and the infolded fibres of the incloſed plant being ſofter would conſequently grow faſter.—The corollary from hence is, that if you would be ſecure of the growing of Poland-oats without the help of rain, they muſt be committed to the earth with more moiſture in it, or before it is ſo dry as it ought to be for barley to be ſown in it; not only becauſe the oats require more moiſture to make them grow, but alſo becauſe they lie ſo many days longer in the ground before they come up than the barley does. The drying ground by the heat of the ſun may be greatly exhauſted of the moiſture in a few days, which otherwiſe had been ſufficient to have ſet the Poland-oat a growing.

Of the Poland-oat—loves moiſt ground.

§. 8. One of my neighbours was telling me, he thought oats would be cheapeſt at Chriſtmaſs, and he would buy them then againſt ſeed-time.—I anſwered they would never keep, for oats of all grain keep the worſt, and they would not grow if fuſty, for I knew a great many farmers would lay up barley about Chriſtmaſs for ſeed, in order to kill the oats that might be in it, preſuming the oats by ſeed-time would be ſpoiled for growing. It is manifeſt that oats take heat in a heap, and by the great wet which comes from them, when heated over the kiln for oat-meal, it is plain they have great moiſture in them; otherwiſe one would think their hulls would preſerve them better than any corn.—From hence it appears why oats are generally deareſt at ſeed-time.

Oats will not keep well—therefore deareſt at ſeed-time.

Muſty oats will not grow.

§. 9. I was ſpeaking to another farmer about pined or muſty wheat, and ſaying that it would not grow. He ſaid, it was true; but added, that pined or muſty oats were more difficult to grow than any other ſort of corn, and yet, ſaid he, I have known muſty corn grow well enough.—I replied, it was becauſe it was ſown on it's firſt growing muſty, before it had received any check by growing cold again, it being then taken in it's growing condition.—He was of my opinion for the reaſon I gave.

And to know them by their colour.

I had an oat-reek, which, taking wet before it was thatched, when it was brought into the barn ſeemed to be in an ill condition, and three weeks-threſhing lying on the floor in the chaff, the heap grew very hot, which I had obſerved for two or three days, and before I winnowed them I thought they had been ſpoiled.—Yet my bailiff would perſuade me to ſow them, aſſuring me, that he had known heated oats grow very well, though heated much longer after winnowed than theſe had been.—I got Mr. Bachelour of Aſhmondſworth to look at them; he ſaid immediately, when he ſaw them, they would grow very well; for, ſaid he, they have not loſt their colour, whereas oats, that have taken heat ſo much as not to grow, will look as red as a fox in their hulls.—All who were in the barn ſaid ſo alſo, and that they had ſeen vetches that had been heated look ſo too.

Of white oats and their tillowing.

§. 10. Being in company with two farmers, we were talking of white oats: they both aſſured me, they had often heard it ſaid, that white oats came up ſingle from their roots, and did not tillow as the black oats did, but——

I could not find by Mr. Raymond (though I had noted an opinon to the contrary in Hampſhire) but that white oats would tillow as much as black, and he ſows as many on an acre as he does of black oats;—but of all oats whatever, if a ground works rough, ſo that many grains are like to be buried, they ſow the more, viz. inſtead of a ſack, five or ſix buſhels.

Of burnt oat-ears.

§. 11. July 17th (anno 1703) I obſerved to-day, that the burnt oat-ears have the ſtraw perfect, and of a good green colour, and their pedeſtal alſo, on which the grain hangs, the ſame, and the grain ſeems to have arrived to a good bigneſs, as in wheat and barley, before that blight fell on it; for certainly the grain could not grow after.

Of oats ſhedding.

§. 12. White oats are moſt apt to ſhed as they lie; and black oats as they ſtand. J. Mortimer, Eſq; F. R. S. fo. 104.

Oats will not ripen if cut green.

§. 13. It is commonly ſaid, that oats cut green will ripen lying in ſwarth.—If by ripening be meant ſhrinking, drying, or withering, I muſt allow the poſition; but if the country-man will have it that the greeniſh oat, a fortnight or ten days, or be it but a week, before it is ripe, will proceed in it's vegetable increaſe, and ſwell as well as harden by lying in ſwarth, I muſt deny it.—This year (1707) I made a full experiment of this matter; for when the ſpring-corn was ſown, the ground being generally dry, half the oats and barley came not up till the latter end of May, when rain came, whereby in moſt places half the crop was edge-grown.—So, the forward-oats being in danger in britting, we were forced to cut down the greeniſh corn with the ripe, when otherwiſe we ſhould have waited ten days longer: I let them lie in ſwarth above a week, and, when I carted them, I found the hull of the greeniſh oat had got a riper colour, and the pith was well hardened, but pitifully lean and ſhrunk; ſo that, though this is to be done on neceſſity, yet it ought not to be practiſed with ſuch indifferency as is uſual among the farmers.—Note, the pith of theſe green oats was well paſt the milk, and come to a floury ſubſtance.

BUCK-WHEAT.

Of it's nature and uſe.

§. 1. [a] MR. Ray ſpeaking of buck-wheat ſays, there is no ſoil but what agrees with it; it loves moiſture, comes up ſoon, and ripens in a ſhort time. The graſs of it, when green, ſerves to feed black cattle, and the ſeed itſelf when ripe is excellent for fattening poultry.

BEANS.

Of the nature of the bean.

§. 1. [b] COLUMELLA thinks that land is not much fructified by leguminous corn, but that they do not much damage the ground. lib. 8. fol. 103. And Palladius has a quotation from him, in which he ſays a lay-ground is better to ſow corn on than a bean-ſtubble.

Obſervation in Somerſetſhire—when the bean-crop is beſt beans are deareſt.

§. 2. I find it is an obſervation with Somerſetſhire-men, that when (as it proved this year, 1709) their beans are very good, they are with them very dear, and then wheat alſo is dear, becauſe the wet ſprings, which make their beans good, hurt their wheat, and they find by experience that wet and cold ſprings in poorer and lighter lands runs the bean out into ſtalk beyond the ſtaple, and then they never kid well, whereas, their deep rich grounds will ſupport the bean under it's freeſt growth.

Beans not proper for the hill-country.

§. 3. I very much doubt whether horſe-beans will ever ripen kindly in our hill-country of Hampſhire; their pod is ſo very moiſt and thick, that, before it can be well dried by the ſun, the cold days and dewy nights ſo increaſe the moiſture, that the bean will rot before it can grow dry.—I the rather believe this, becauſe I ſowed garden-beans in February, but could never get thoſe that I deſigned for ſeed to ripen.

Different ſorts of land uſed for beans.

§. 4. About Biſhop's-cannons, All-cannons, and Stanton they ſow horſe-beans in their common-fields without any laying the ground down to a ſword, but about Holt they do not venture to ſow ground to beans, unleſs it has lain down two or three years to graſs, and has got a ſword: the reaſon the farmer there gives is, becauſe the land about Holt is not ſo ſtrong as about All-cannons, &c.

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[a] Nullum fere ſolum refugit: gaudet imbribus, cito provenit, celeriter matureſcit: herbam viridem, priuſquam ſemen maturuerit, boves, jumentaque paſcuntur: ſemine gallinaceum genus paſtum citiſſime pingueſcit. fo. 182.

[b] Palladius, ſo. 114. De faba, dicit, ſatione ejus generis, ſicut opinio habet, non fæcundatur terra, ſed minus læditur. Nam Columella dicit, agrum frumentis utiliorem præberi, qui anno ſuperiore vacuus fuerit, quam qui calamos fabaceæ meſſis eduxit.

Quantity of beans on a ſtalk.

§. 5. After the fertility of wheat mentioned by Pliny, he ſays of the bean-ſtalk, that one has been known to produce a hundred beans. Inventus eſt jam et ſcapus unus centum fabis onuſtus. Plin. lib. 18. fo. 277.

Of the different kind of horſe-beans, and their management.

§. 6.[c] Mr. Smith of Stanton ſays, horſe-beans are abundantly a more certain grain than peas; that there are three ſorts, viz. the Somerſetſhire horſe-beans, which are the largeſt, and a middle ſort, and the leaſt or ſmalleſt ſort.—He ſays, the largeſt ſort are too big for his land, and that he chooſes to ſow the middle ſort.—They never ſow them, he ſays, till the middle of February, or the latter end; they ſow five buſhels on an acre, and are not in danger of rooks after they are full come up; he cuts them a little before they are full ripe, otherwiſe in mowing the ripeſt are apt to ſhed; that, take one time with another, he has double the crop of beans to what he has of peas; that he never plants them, becauſe planted beans muſt be houghed, and, where ground is apt to bind, and bake, the hough cannot eaſily enter to raiſe a grete, eſpecially where the land is ſtony.—He aſſures me, that broad-clover will grow very well with beans; and that he has often ſeen the experiment of it.

Of beans loving moiſt land.

§. 7. When Pliny and the Rei ruſticæ ſcriptores ſay, that the bean delights in much wet weather.—It muſt be conſidered, that they lived in Italy, a much hotter country than ours; for in England we know that beans deſire a moderate ſeaſon: in hot ſummers, like this, anno 1707, their lower bloſſoms only kid, and in wet ſummers they do not bloſſom well.

PEAS.

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[c] As Mr. Liſle has but few obſervations on the culture of horſe-beans, and as Mr. Miller is more particular on that ſubject, I judge the following note, taken from that author, may be acceptable and uſeful to thoſe, who are deſirous of information in this part of huſbandry.—" The horſe-bean delights in a ſtrong moiſt ſoil, and an open expoſure; for they never thrive well on dry warm land, or in ſmall incloſures, where they are very ſubject to blight, and are frequently attacked by a black inſect, which the farmers call the black-dolphin: theſe inſects are often in ſuch quantities as to cover the ſtems of the beans intirely, eſpecially all the upper part of them; and whenever this happens the beans ſeldom come to good; but in the open fields, where the ſoil is ſtrong, this rarely happens.—Theſe beans are uſually ſown on land, which is freſh broken up, becauſe they are of uſe to break and pulverize the ground, as alſo to deſtroy weeds, ſo that the land is rendered much better for corn, after a crop of beans, than it would have been before, eſpecially if they are ſown and managed according to the new huſbandry, with a drill-plough and a horſe-plough.—The ſeaſon for ſowing beans is from the middle of February to the end of March, according to the nature of the ſoil; the ſtrongeſt and wet land ſhould always be laſt ſown: the uſual quantity of beans ſown on an acre of land is about three buſhels; but this is double the quantity that need be ſown, eſpecially according to the new huſbandry: but I ſhall firſt ſet down the practice according to the old huſbandry, and then give directions for their management according to the new.

The method of ſowing is after the plough, in the bottom of the furrows, but then the furrows ſhould not be more than five or at moſt ſix inches deep. If the land is new broken up, it is uſual to plough it early in autumn, and let it lie in ridges till after Chriſtmaſs; then plough it in ſmall furrows, and lay the ground ſmooth: theſe two ploughings will break the ground fine enough for beans; and the third ploughing is to ſow the beans, when the furrows ſhould be made ſhallow as was before mentioned. Moſt people ſet their beans too cloſe; for, as ſome lay the beans in the fur-

P E A S.

Of the growth and bloſſoming of peas.

§. 1. ANNO 1708.—When the field and garden-peas this year were near a foot high, I obſerved on the very top of them a purſe or neſt of buds of bloſſoms, lying in a bag together; and obſerving farther that there was no ſhow of bloſſoms putting forth at the lower joints, I concluded our crops of peas would this year miſcarry, and that we ſhould only have ſome top-kids, all expectation of the lower kids being vain, becauſe the kids on the lower joints are always forwarder in bloſſoming and kidding than the upper, or top joints, and, as I ſaid before, there was no appearance of bloſſoms in any of the lower gradus of joints: this afforded me ſome amuſements in reaſoning, but, not being ſatisfied, in a day or two after I looked into theſe upper pods or bags of bloſſoms again, and diſſected them; wherein I found ſometimes near thirty bloſſom-buds, two or three of which uſually ſeemed to have

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rows after the plough, and others lay them before the plough, and plough them in, ſo, by both methods, the beans are ſet as cloſe as the furrows are made, which is much too near; for, when they are on ſtrong good land, they are generally drawn up to a very great height, and are not ſo apt to pod as when they have more room, and are of a lower growth; therefore I am convinced by ſome late trials, that the better way is to make the furrows two feet aſunder, or more, which will cauſe them to branch out into many ſtalks, and bear in greater plenty than when they are cloſer: by this method half the quantity of beans will be ſufficient for an acre of land; and, by the ſun and air being admitted between the rows, the beans will ripen much earlier, and more equally than in the common way.—What has been mentioned muſt be underſtood as relating to the old huſbandry: but where beans are planted according to the new, the ground ſhould be four times ploughed before the beans are ſet; which will break the clods, and render it much better for planting: then with a drill-plough, to which an hopper is fixed for ſetting the beans, the drills ſhould be made at three feet aſunder, and the ſpring of the hopper ſet ſo as to ſcatter the beans at three inches diſtance in the drills. By this method leſs than one buſhel of ſeed will plant an acre of land. When the beans are up, if the ground is ſtirred between the rows with a horſe-plough, it will deſtroy all the young weeds; and when the beans are advanced about three or four inches high, the ground ſhould be again ploughed between the rows, and the earth laid up to the beans; and if a third ploughing, at about five or ſix weeks after, is given, the ground will be kept clean from the weeds, and the beans will ſtalk out, and produce a much greater crop than in the common way.—When the beans are ripe, they are reaped with a hook, as is uſually practiſed for peas; and, after having lain a few days on the ground, they are turned; and this muſt be repeated ſeveral times, until they are dry enough to ſtack: but the beſt method is to tie them up in ſmall bundles, and ſet them upright; for then they will not be in ſo much danger to ſuffer by wet, as when they lie on the ground; and they will be more handy, to carry to ſtack, than if they were looſe. The common produce is from twenty to twenty-five buſhels on an acre of land.—The beans ſhould lie in the mow to ſweat before they are threſhed out; for, as the halm is very large and ſucculent, ſo it is very apt to give, and grow moiſt; but there is no danger of the beans receiving damage, if they are ſtacked tolerably dry, becauſe the pods will preſerve the beans from injury; and they will be much eaſier to threſh after they have ſweat in the mow than before; and after they have once ſweated, and are dry again, they never after give.—By the new huſbandry the produce has exceeded the old by more than ten buſhels on an acre; and, if the beans, which are cultivated in the common method, are obſerved, it will be found, that more than half their ſtems have no beans on them; for, by ſtanding cloſe, they are drawn up very tall; ſo the tops of the ſtalks only produce, and all the lower part is naked; whereas, in the new method, they bear almoſt to the ground; and, as the joints of the ſtems are ſhorter, ſo the beans grow cloſer together on the ſtalks.

have got the ſtart of the reſt, and to be bigger in bulk, and higher in ſtature; moſt of the reſt ſeemed to lie in a huddle, without making any gradations; but as I never had ſeen, unleſs in the crown-pea, (which carries all it's bloſſoms in a tuft at top, like a noſegay) other peas put forth above two bloſſoms and kids at top, which ſeldom come to good, ſo I ſuſpected in this pod, there being ſo many bloſſoms in it, that they muſt form the ſucceſſive gradations of bloſſoming-joints, which did ariſe from that ſtock as from a common root, and ſo, that every bloſſom in order, as it grew forwarder than the reſt, did ſhoot forth, above which the main ſtem ſtill advancing made the bloſſom left behind the ſubaltern bloſſom of a lower joint;—to try which I tied ſcarlet threads juſt under many of the ſaid pods, that I might know them again, and, according to expectation, I found in four or five days time that I had ſeveral gradus of bloſſoms, ariſing from joints with lobous leaves above my ſcarlet threads, and the pod of bloſſoms ſtill advanced on to the end, leaving behind farther joints of bloſſoms, till the whole ſtock was ſpent.

Inferences from the foregoing obſervation.

This obſervation was very pleaſing to me, as being obviouſly fruitful of many corollaries, which I ſhall ſet down in order.

(1.) By looking into this pod, or purſe of buds, while as yet it is ſo in it's infancy as only to be viewed by a magnifying glaſs, we may judge what hopes there are of a future crop, provided the ſucceeding months prove ſeaſonable.

(2.) We may learn from hence what ſort of peas to adapt to every ſort of ground;—but, before I enter on that part and uſe of the abovementioned obſervation, I muſt, for the better underſtanding thereof, premiſe, that the farmers vary in their judgment in no one point ſo much as in the nature of the pea: it is a common thing in the ſame pariſh to have many ſorts of peas ſown; and the perſons reſpectively ſhall every one have a great prejudice to any other ſort of pea, but what they ſow, having, it is likely, been diſappointed of the return other ſorts of peas made, when they ſowed them, and it is likely may ſoon grow out of opinion of the pea they have made choice of, from the great uncertainty of the produce of a pea-crop; ſo that the pea, in the country-man's underſtanding, has got the character of a very * kittle grain.

But if the farmer would conſider, from the foregoing obſervation, how early or rath-ripe a pea is, or how late in ripening in it's nature; and that (ſeeing all it's ſtock or poſſe to put forth bloſſoms lies within the foliage of one pod) the art muſt reſult from thence, ſo to ſow the peas, in ſuch ground, and at ſuch time, that each ſort of pea, according to it's nature, may have time before autumn and cold weather come to check them, to ſend forth all the gradations of joints or bloſſoms, that none may become abortive, for want of ſummer enough for nature to bring her embrio's to maturity, and finiſh the bud-bloſſoms into kids.—If ſo, then it is apparent (as all great peas are late ripe, and run to a great halm or ſtalk, and the ſmaller the pea is, the earlier ripe, and of ſmaller halm) that the great, or late-ripe peas, ſhould be ſowed as early as the clime you live in will permit; for thereby ſuch pea will get ſo forward as to have time to exert all it's gradations of kids and bloſſoms, and to have them perfected before rainy autumn comes, and puts a ſtop to farther vegetation.

* ſubject to accidents—uncertain.

vegetation—Again, ſuch great pea ought to be ſowed on a white, or ſome mixt land, not too groſs of juice, but not on a cold clay; for ſuch moiſture will keep feeding the halm, and be inconſiſtent with the firſt deſign of ſowing them early, that you might have all the bloſſoms ripen, ſeeing ſuch land will retard it's progreſſion to ſuch maturity; but the ſaid white, or mixt mold muſt be in good heart, otherwiſe it cannot maintain a great pea; ſo, vice verſa, it is from hence apparent that a rath-ripe pea ſhould be ſowed in ſtrong feeding-land, becauſe ſuch land will maintain the pea more vigorouſly, and there is no fear of it's halm growing too groſs, it being naturally ſhort, and, notwithſtanding the coldneſs of the ſoil, there will be no doubt but the kids will all ripen.

§. 2. There are a great many ſorts of field-peas, whereby the country-people are puzzled, and are governed by humour in their choice for ſowing, and make great diſtinctions between the ſorts to be ranged under the ſame claſs, from their good or bad luck, or good or bad judgment, in managing their ground; inſomuch that a neighbouring farmer, on the ſame ſituation of ſoil with another, ſhall be out of patience to hear ſuch ſorts of peas commended by his neighbour, with which he has had ill ſucceſs.—The ſorts of field-peas then I take to be ranged under two heads, viz. the tender and the hardy ſmall ſort, and the tender and the hardy great ſort, not doubting but all ſorts of peas, to be ranged under either of theſe claſſes, will equally agree or diſagree with the ſame ſoil: the tender pea is improper for a cold country, or for cold ground in a warm country, which amounts to the ſame thing; the great pea, by reaſon of it's great halm, is not proper for a ſtrong and fat ground, for the halm will increaſe to ſo great a length as not to bear kids. I am ſatisfied from my peas this year (1704) ſown on ſtrong cold ground and peas-ſtubble, and others ſown on barley-ſtubble, that to lay peas on a mellow light mold, made ſo by ploughing, is much the beſt way to bring along, and make a full-kidded pea; for the latter, tho' not on ſo good ground, had both thoſe advantages of the former.

What ſorts of ground ſuit different ſorts of peas.

§. 3. Mr. Raymond, who lives near Patny in Wiltſhire, ſays, in thoſe parts they had uſed to ſow hotſpur-peas in their fields, but that now (anno 1708) they grew weary of it.—I aſked him the reaſon; he ſaid, thoſe peas did not run out to ſo long and leafy a halm, nor lie long enough on the ground to improve and mellow it, but the other peas did much better.

Of the hotſpur pea.

§. 4 Farmer Elton, Mr. Edwards, and I fell into diſcourſe about peas; it was anno 1700.—They agreed that Cotſhill-peas were about twenty years ago the only peas ſowed in this country, i. e. in Hampſhire; they are a very large pea, near as big as a horſe-bean; they grow exceeding rank, and kid wonderfully in a year that they take in, but are a more * kittle grain than the partridge-peas; they muſt be ſowed early, and run out ſo rank that they are late ripe, and therefore ſubject to blights: the farmer uſed to ſow them in the middle or latter end of February, and to take a very dry time for it; no matter if ſnow ſhould fall afterward, he has had three quarters on an acre; but they both agreed, that of late years the partridge-pea has been more in eſteem;

Of the Cotſhill pea.

* uncertain.

teem; it is ſo called from it's reddiſh ſpeckles; it is a more certain grain, and earlier ripe, and ſo leſs ſubject to blights than the Cotſhill-pea, which is nevertheleſs the better pea to fat hogs with, becauſe they will not be ſo apt to ſwallow them whole.

Farmer Crapp, and farmer Biggs ſay, the Cotſhill-pea does not well in the hill-country of Hampſhire, becauſe the country is cold, and the halm of that pea runs ſo large, and to ſuch exuberancy of juice, eſpecially if the field lies to the north, that the ſun cannot ripen it, nor dry it, and check it; ſo that, eſpecially in a moiſt ſummer, it will keep on blowing, but not kid well.—I take this to be true, and yet very reconcileable with what is ſaid in another place of the great increaſe of the Cotſhill-pea in a certain field, for that is not a feeding cold clay-ground, but lies warm: on the other hand, why the farmers ſhould ſay, that the ſmall partridge-pea required the beſt land and the Cotſhill-pea the pooreſt, is eaſily reconcileable;—for the good land in the hill-country is generally the ſtrong clay, but the halm of that partridge-pea will not run out ſo rank that the ſun cannot check and dry it. Again; the mixt ſort of earth, running to a whiteneſs, is generally poorer than the ſtrong clay, yet it is not in truth poor, for where the Cotſhill-pea thrives there muſt be good ſtrengrh in the ground, to maintain ſuch a halm.

Of white and blue and red bloſſomed peas in boiling.

§. 5. Mr. Randolph of Woolly, who has been a great ſower of all ſorts of peas, gives it me for a certain rule, that all white-bloſſomed peas, whilſt green in the kid, will boil green, and all blue or red-bloſſomed peas, whilſt green in the kid, will boil ruſſet-coloured.

Of partridge-peas.

§. 6. Regard is to be had in ſowing great partridge-peas under furrow (where the ground is ſubject to run to graſs, or is knotted with graſs that is pretty thick ſet on the ground) to what may happen to them in caſe of a wet ſummer; as for inſtance, if in ground that has born broad-clover for one ſummer you ſow peas under furrow the following February; for though perhaps ſuch ground may break pretty well in ploughing, ſo as for the peas to come through, yet in caſe there ſhould come a cold and wet ſpring, and a wet ſummer, the graſs will, long before harveſt, ſo grow through the peas, after they begin firſt to fall, and at laſt ſo over-top them, that you will be amazed, when you come to ſtack them at harveſt, to ſee perhaps what was a very promiſing crop of peas in May and June ſo devoured by graſs, that the very halm as well as the kids ſhall ſeem withered away, and almoſt blighted to nothing.

If ground be apt to run to graſs, or be knotted with graſs before it is ploughed, and be ſowed to peas on one earth, if a very wet ſummer ſhould come, the peas will be over-run, and eat up with graſs; to prevent which, and to fence againſt this inconveniency in wet ſummers, if the peas are ſowed on one earth, the ground muſt either be knot-fine, or elſe be fallowed to kill the graſs, and ſowed on the ſecond earth.

Of the blue pea.

§. 7. The blue peas, with us, run much larger than the ſmall partridge-peas, and conſequently fill the buſhel better: they kid, as I have obſerved, better than the other, and are a * rather ſort, and will therefore bear ſowing the later, as about the beginning of April, when the inclemency of the air is over; and being to be cut greeniſh, they may be ſtacked the earlier, which are good properties in our cold hill-country.

* earlier ripe.

The Burbage-grey, or popling-pea.

§. 8. The Burbage-grey or popling-pea is much ſowed in the deep lands of Somerſetſhire, and called there, the clay-pea.

Peas love a dry and healthy ſoil.

§. 9. I find by all the judicious farmers I can converſe with, that, though peas will not grow on poor light land, but require ſome depth of ſoil and ſtrength, yet at the ſame time peas will not thrive well in a cold wet clay-land, but love a dry healthy ſoil.

I obſerve about Holt in Wiltſhire, where the land is generally wetter than at Crux-Eaſton, that they lay up the pea-lands in ſmall round furrows, and they ſow the great partridge-pea under furrow, if they can have a ſeaſon as early as Paul's-tide, i. e. the 25th of January; and the reaſon they give for it is, becauſe being ſown ſo early they would lie too cold, if they laid the lands flat.—Though I lie not ſo wet, yet, my clay-lands being cold, I am of opinion that I ought to imitate this huſbandry, when I ſow peas early.—The coldneſs of the ſituation of Crux-Eaſton is alſo a farther reaſon for ſo doing, becauſe the cold air will not have ſo much power of chilling the earth, when laid in this manner dry, as it will have when lands hold wet by lying flat; for earth will not freeze, nor receive any impreſſion from cold, but on account of it's moiſture, in which the more it abounds the colder it will be, according to the degree of the coldneſs of the air.—In Wiltſhire, if the land breaks tolerably rotten or mellow, they omit a tining with the harrows, which would alſo be the beſt way in our cold country.

Of green peas.

§. 10. A farmer in my neighbourhood having moſt excellent boiling-peas, which they call green-peas, I propoſed to ſow of them on a lay-ground I had grubbed; but the farmer forbad it, and ſaid, if they were ſown on lay-land, they would run to halm, and not kid: light barley-erſh, he ſaid, was beſt for them, and that, if they hit, they were mighty increaſers; that they muſt be ſown about the beginning of April, and they yielded as good money, and as certain as any corn, but they were a tickliſh grain.

Peas do beſt on a barley-erſh, and why.

§. 11. The country-people ſay, peas do beſt on a barley-erſh; the reaſon of which muſt be, becauſe how much finer the ground works ſo much the more does the earth, every part of it being opened, communicate of it's goodneſs to the peas-halm, which being groſs requires good nutriment to feed it; and where the ground lies lighteſt, provided it be not thereby liable to the evil on the other hand of burning, there the rain will not waſh the goodneſs of the land to the roots of the corn, and feed it; and I do believe the ſun in ſummer prepares the thin topmoſt cruſt of the earth with rich ſpirits, which, when waſhed into the earth, muſt fructify plants.

The only reaſon I can give why peas ſhould thrive ſo well on barley-erſh, (tho' poſſibly the land may be much poorer than lay-ground) is, becauſe barley-land has for the moſt part been mellowed by a wheat-crop the year before, and alſo fallowed, if not thwarted the barley-year: the ground for theſe reaſons is very mellow and light, and eaſily admits the rays of the ſun, the rain, and the dew to penetrate to the roots of the peas; whereas the groſsneſs of the peas-halm ſo over-ſhadows the ground from thoſe three powers, that, where the ground lies more cloſe and hard, thoſe powers are not ſo acceſſible to the roots of the peas; for this reaſon it follows, that land, if not of a very light nature, is to be fallowed and thwarted for peas: peas ought alſo to be ſowed early in the year, that they may ripen between ſun and ſun; the groſsneſs of the halm ſo much reſiſting the powers of the ſun, and obſcuring him when he grows weak, that the peas cannot ripen in good time, and, if the ground lies not mellow and warm, they run out to halm and do not kid well; for the juices of the ground ought to be well digeſted alſo, to be fit to make flowers come in the joints of the peas-halm, in order for bloſſoms: beſides, the earlier you ſow your peas, the more hopes you have of the bloſſoms in the upper joints coming to perfection, which by their backwardneſs are generally loſt; and if theſe upper kids can get forwarder than the coming of the locuſts or green louſe, ſo as to be too hard for their teeth, they will (by being earlier ſowed) eſcape all that damage; and note, as it is in the green herb, ſo the early coming of all inſects depends on the clime, and the nature of the ſoil, be it cold or hot, if the inſects are ſuch whoſe ſeeds are laid in the earth.

[a] Pliny, ſpeaking of the bean, ſays, in ſome of the northern iſlands and in Mauritania it comes up of it's own accord, and without tillage, but that it is of a wild ſort, very hard, and unfit for boiling.—I note this, becauſe it's ſeed ſowing itſelf falls on untilled ground, and therefore boils hard; for we obſerve in peas, that the more mellow the ground is, the better they boil, therefore boil well from barley-erſhes.

Farmer Biggs obſerved to me, that laſt year (1702) he had the experience of ſowing peas after barley, in a ground where peas had been ſown the year before the barley, and that, though it was in a bottom, yet he had poor halm, and poor kids, whereas on two or three lands adjoining, and much poorer land, where peas had not been ſown ſome years before, he had a very good crop of peas.

Land ſowed to peas will not bear peas well again for ſix years.

§. 12. Mr. Raymond ſays, he has always obſerved, that land, which has carried peas one year, will not be fit for them again in leſs than ſix years time: if you ſow them ſooner, they may poſſibly run to halm, but will not kid well, and ſo, ſaid he, our neighbouring farmers have obſerved—I ſuppoſe white or light land, being ſo much the ſooner robbed of all the ſpecifick nutriment of the grain by the crop of the ſame grain it carried laſt, cannot be ſo often renewed to peas as clay-land may, and the oftener land is dunged the ſooner it will recover, I judge, that ſpecifick nutriment adapted to each grain.

§. 13.

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[a] Naſcitur et ſuâ ſponte pleriſque in locis, ſicut ſeptentrionalis oceani inſulis, quas ob id noſtri fabarias appellant, item in Mauritaniâ, ſilveſtris paſſim, ſed prædura, et quæ percoqui non poſſit. Plin. lib. 18. fol. 283.

Peas degenerate.

§. 13. Peas, of all ſorts of grain, degenerate ſooneſt, at leaſt in two or three years, be the land never ſo good. Evelyn, fo. 324.

The honey-comb or pitted pea.

§. 14. The honey-comb or pitted-pea ought not to be ſown on the hills in Hampſhire, for ſuch pea is a cold pea, as not being fully ripened, but ſhrunk, and will not grow well in cold ground.

Hop-clover not to be ſowed with peas.

§. 15. It is ſaid hop-clover ought never to be ſowed with peas; they'll cover the clover ſo as to kill it: peas will kill the very weeds, and that is one of the reaſons why peas prepare the ground for barley.

But farmer Biggs aſked me why I had not ſowed a certain field, ſown to peas, to hop, or broad-clover; and on my anſwering that I doubted whether the peas might not have killed it;—he replied, there was no fear of peas hurting it, where the ground was not rank,—and ſo I found; for at the lower end of the field, where the farmer ſowed his goar-vetches, I ſowed hop-clover, and it came up as well as any where.

Of the blue vapour on peas, and of the weather that beſt ſuits them at bloſſoming-time.

§. 16. I obſerved the green halm and leaf of my peas ſown on a ſummer-fallow carried a ſtrong deep green, and had a blue vapour on the halm and leaf, like the blue ſteam on plumbs, which accompanied them to their flowering; but on peas leſs in proof, the leaf is of a paler green, and has leſs of that blue vapour.—I take this blue vapour to be an exſudation from the plant, and is the effect of a good inſenſible perſpiration, and denotes health in the plant, and ſuch plumbs and corn as have leaſt of it are leſs in proof.—This blue exſudation goes off of the leaves and ſtalk a little before bloſſoming-time, and then they grow paler.--We had a cold cloudy dripping ſeaſon during the bloſſoming-time of theſe peas anno 1715) and it was very obſervable to me, that both my ſorts of peas (of which I had an hundred acres, great grey partridge-peas, and blue popling-peas) bloſſomed very blindiſh, as peas will do in hot ſcorching dry weather at the bloſſoming-ſeaſon; ſo that I fully concluded that neither of the extreams, either of wet or drought, were ſo agreeable to peas as moderate rain with heat at their bloſſoming-ſeaſon; but the continuance of many days cold rain muſt be prejudicial;—yet whether the hot burning dry weather be not worſe than the other is a queſtion.

To turn the wadds in rainy weather after hacking the peas to prevent britting.

§. 17. If it be a dripping and rainy harveſt, in the pea-ſeaſon, between the ſhowers, when the upper part is dry, tho' the rain may have wet the ground through the wadds, to turn the wadds of peas will ſave the kids from britting and ſhedding; for nothing makes peas more ſubject to open the kids than lying ſogging in the wet; therefore, in hacking them, to make the wadds ſmall, is a preſervative, if the weather be ſhowery, againſt their britting, becauſe the ſmaller the wadds are the ſooner they dry.---Of this I was very ſenſible this harveſt (anno 1707) it being very ſhowery; for the Newbury-men's wadds being hacked large, britted much, when our people's leſſer wadds ſuffered no damage: add to this, that the ſmaller the wadds the ſooner will the peas be fit for carting, whereby a day gained often ſaves a whole crop from damage.

Mark of peas being well bloſſomed.

§. 18. When peas are well bloſſomed, there are two bloſſoms that divide themſelves in forked-foot ſtalks on every ſtem; whereas many years there is but one bloſſom on each ſtem.

Mr. Quinteny's obſervation on peas bloſſoming not true in field-peas.

§. 19. Monſieur de Quinteny ſays, fo. 156---That the bloſſoms of peas commonly ſpring out from the middle of the fifth or ſixth leaf, from whence there ſprings an arm or branch, that grows exceeding long, and produces at each leaf a couple of bloſſoms like the firſt.——On reading this I went and viewed my peas, in a field where they were extraordinary good;---I found for the moſt part that no bloſſoms appeared till, reckoning upwards, you came to the ſixth or ſeventh leaf, but where the pea-halm ſeemed not to be in good heart, no bloſſom appeared till you came to the eighth or ninth leaf, nor could I in any of the field-peas find any collateral bearing branch to iſſue out, as deſcribed by Monſieur Quinteny, but I did obſerve ſuch a branch to iſſue out in my hotſpur garden-peas.

Vetches greater increaſers than peas, and of the fly that breeds in them.

§. 20. The top bloſſoms of peas bring forth but a ſmall blighted kid, and hang late on the halm before they kid at all, ſo that they ſeldom come to good;—but in my vetches I obſerved many collateral tillows on the ſtalks, even from the root upwards, ſo that there were commonly five or ſix collateral branches ariſing, one above another, in two or three joints on a ſtalk.—I alſo obſerved a downy cotton bud to ariſe from the ſecond and third joint, juſt above the leaf, and ſo for the moſt part all along, where there were no kids: this bud, though but ſmall, ſeemed to me to be a bud deſigned for a flower, but miſcarried by the unhappy ſeaſon of the year.—So I infer from hence, that vetches, where they hit, are much greater increaſers than peas.—Whereas I was of opinion, that the miſcarriage both of peas and vetches happened from the eggs of flies laid in the upper pod of each, I am now of the contrary way of thinking, viz. that the miſcarriage of the crop, both in peas and vetches, is in their lower bloſſoms, which ought therefore to be earlier looked into, it being of no great conſequence how the upper pods are deſtroyed, becauſe their kids never come to perfection: nevertheleſs it is not unlikely but the maggot bred in the upper pods, whether by flies eggs, or not, may travel downwards, and eat up the lower kids and leaves.

More on Mr. Quinteny's obſervation.

§. 21. It is ſaid by Quinteny, (as before cited) that peas commonly bloſſom at the fifth or ſixth leaf; which is, as I ſuppoſe, in dry and hot ſummers, when the halm is checked from running too groſs, and to ſo many joints; but, when in a wet year the halm runs out to a great length, the ſtalk at the fifth, ſixth, or ſeventh leaf, is ſo groſs and over-ſhadowed by the other leaves, that the juice is not concocted enough till it has advanced more into the ſun, ſo as to emit the bloſſoms.—And it ſtands to reaſon, that peas ſet on ſticks ſhould kid better than thoſe that lie all along,—and the well bloſſoming of beans ſeems to depend on the ſame reaſon; therefore field-peas when ſowed thick do the better uphold themſelves by their ſtrings, to let in the ſun and air, till they fall by the weight of their kids.

If the bloſſoms open not full, it is a bad ſign.

§. 22. It is obſerved both in Hampſhire and Wiltſhire, that peas never kid well that year, in which they blow blind, that is, when their bloſſoms open not full, as it happened anno 1705—a wonderful dry ſummer.

Of the ſpur at the end of one of the ſtalks of the pea.

§. 23. When I was at Holt anno 1712—I obſerved in the peas, while bloſſoming, that where there was but one ſingle bloſſom on a foot-ſtalk, there generally grew up a little ſpur, near an inch behind the bloſſom, on the ſame ſtalk, in height about the length of a barley-corn.—I ſuſpected that another bloſſom had grown thereon, and that the claſpers of the peas had taken hold of it, and pulled it off by the power of the wind, or that ſome other accident had deſtroyed the bloſſom; but at this time, looking a little nicer into the matter, I laid open ſome caſes, wherein the bloſſoms unblown lay in a cluſter, as in a purſe, and there I obſerved, that generally to the foot-ſtalks of the ſingle bloſſoms there alſo grew a ſpur; only here the ſpur was very ſmall and ſhort, not of half a barley-corn's length, and very tender; theſe ſpurs advance in ſtature and ſubſtance as the contiguous bloſſom grows, and by that time the kid grows full, it will be as long as two or three barley-corns, and of ſtrength proportionable, like a pea's-ſtalk: ſo that one might well ſuppoſe a pod had grown on it, and been pulled off by ſome violence, but doubtleſs it is an effort in nature towards producing a bloſſom, ſince it is ſeated in the very place where a bloſſom grows, whenever the foot-ſtalk carries a double bloſſom; and I preſume in rich land, and a hotter country, there rarely fails being two bloſſoms on every foot-ſtalk.

The leaves of the bloſſoms turning back a good ſign.

§. 24. I have obſerved, when ground is in good heart, and rain falls ſeaſonably to feed the peas, that their bloſſoms blow ſtrong (as before taken notice of) and further here I add, that the two outermoſt and larger leaves of the bloſſoms, which look like hoods, expand themſelves in ſo ſtrutting a manner as to bend backwards; when they do ſo, it is a ſure ſign of vigour; from ſuch bloſſoms there certainly will come a noble kid; whereas, when the bloſſoms blow blind or faint, ſome of them fall off, or tho' they ſhould be ſtrong enough to produce a kid, 'tis commonly but a poor one, and often of a ram's-horn figure;—and it may often be ſeen, that, when the firſt bloſſoms blow vigorouſly, in a hot dry ſummer, (but to effect this, there muſt be good heart in the ground too) if the dry weather continues, the latter bloſſoms ſhall blow very ſickly, and make but ſtarved kids, and many of the buds will want ſtrength to put forth a bloſſom, and wither; yet, if a lucky rain comes in time, it will ſave them, and ſo ſtrengthen them, that they'll go on blowing with a lively colour.

Senſation of plants, particularly peas.

§. 25. By the expanſion or contraction of the leaves of peas the degrees of the cold nights may be ſeen; their flowers alſo, if put into warm water, will in an inſtant open; which ſhews the wonderful conſent of parts, and communication of particles in ſome plants, analogous to the ſpirits of men, by which there is ſuch a quick ſenſation through the nerves.

Peas not ſo well ripened nor ſo hard in the hill-country as in the vale.

§. 26. This year (1716) I houſed my peas, as I thought, in excellent order, they having taken no rain, and being thoroughly ripe; yet, when carried to market, they were ſofter than other peas, nor would they rattle when handled in the ſacks like ſome others.—The reaſon of which muſt be, that in our hill-country the weather towards autumn is not hot enough to puſh them on to that thorough ripeneſs as in the vale, and as they muſt lie ſome few days in the field, after they are cut, to be thorough dry and hardened, ſo our days are cooler, and our nights both colder and more dewy than in the vale, and therefore ſore our peas are not dried to ſo great a degree of hardneſs as theirs; and this difference (cæteris paribus) holds good in other corn between the hill-country and the vale.

Cuſtom in Leiceſterſhire.

§. 27. In Leiceſterſhire they ſet all their peas abroad in ſtacks, and houſe none, becauſe (as they ſay) ſetting them abroad gives them a good colour, whereas laying them up in a barn makes them look dark.

VETCHES.

Opinion of the antients concerning vetches.

§. 1.[a] ACcording to Columella, if, when you cut up vetches and lupines green for food, you leave the roots to grow dry in the ground, they will impoveriſh, and take away all it's ſtrength; and he ſays, it is the ſame of beans.

Opinions of various farmers of the profit from vetches.

§. 2. Farmer Biggs ſaid, vetches were the moſt profitable grain that could be ſowed; that a load of them would go farther than two load of hay; he ſaid farther, if they were ſowed on land ſomewhat light, where they would not run up very rank, they were excellent for ſheep, being reaped a little earlier than they are for the horſes, and when dried the ſheep would eat up every little bit of ſtalk.—Thomas Elton ſaid, vetches were the moſt profitable grain that could be ſowed, but he held that goar-vetches were apt to ſcour too much, eſpecially if the weather was wet and cold.—Farmer Lake and farmer Bond agreed, that goar-vetches were beſt for horſes when they were juſt in kid, but earlier than that, eſpecially in cold and wet weather, they were too groſs, and not ſo hearty.

Vetches will grow even without harrowing.

§. 3. I was telling the abovementioned farmers, that ſome of my vetches ſeemed to be uncovered, and not to have been harrowed enough —They ſaid, if vermin did not meet with them, vetches would work themſelves into the ground, and that they had ſown them when ſo much rain followed that they could not harrow, and yet had as good a crop of vetches as at other times.

Vetches improve ſtrong, red clay-land.

§. 4. I had a very fine crop of vetches in a falling white land, of about three loads upon an acre, yet the ſucceeding crop of barley was but ordinary; and indeed it ſeems to ſtand to reaſon, that a good crop of vetches is only a conſiderable improver of ſtrong, or red clay-land; for in ſuch land they do not only run ranker, whereby the halm betters it, but it alſo mellows ſuch land, which is very material towards a barley crop; whereas in poor white land, tho' the vetches may kid well, yet they ſeldom run to a good halm; nor is it material for white land to be hollowed and made light by the vetches, it's heavineſs being no defect before; therefore I hold, that, tho' a good crop of vetches be on a white and poor land, yet it is not a ſoil to be depended on, without folding, toward a barley-crop.

§. 5. I

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[a] Si lupini et viciæ radices defecto pabulo relictæ inaruerint, ſuccum omnem ſolo auferunt, vimque terræ abſumunt, quod etiam in faba accidit. Columella, lib. 2. cap. 14. Pallad. ad idem, lib. 1. ſect. 6.

White land bad for vetches.

§. 5. I ſowed winter-vetches (anno 1703) on poor white land, and had but eleven load of vetches off ſeventeen acres, beſide the tythe, and yet it was a very wet dripping ſummer, which favoured their growth extreamly; otherwiſe there might not have been two load on the ſeventeen acres: this ought to be a caution not to ſow vetches on poor white land.

Not to crop vetches.

§ 6. Wheat will endure the winter better than winter-vetches; for, if wheat loſes it's top by the cold, it will grow again, but if vetches are cropt, though they come to halm, they'll neither bloſſom nor kid.—It is the ſame with peas as with vetches, if they are bit;—and if they kid not tolerably, the beſt way is to give them to the horſes.

Of the great profit of winter-vetches.

§. 7. By ſowing a good quantity of winter-vetches there are ſeveral advantages, the leaſt of which, and the moſt obvious is to render the ground fit for a barley-tilt, and ſo knot-fine as to be capable (after it has been, if you pleaſe, winter-folded, as an additional richneſs) of being ploughed up and ſown on one earth.—And if the ſummer be wet, ſo as the meadows afford graſs enough for hay, and the year is not encouraging, thro' frequent rains, to cut the vetches for dry fodder, and make them into hay, the ſeed however (preſerved for ſowing) is profitable.—But the greateſt benefit ariſing from vetches (in caſe the ſummer be burning-hot, ſo as the meadows afford little hay) is that in ſuch time the vetches cut, when the flowering is juſt over, or when the pods are half full with ſeed, are of great uſe to ſupply the defect of hay, and make the nobler fodder for the year's being ſcorching; for at ſuch times the vetches are not apt to run to ſuch lengths as to rot on the ground, and you have commonly a good ſeaſon for making them into hay, and by cutting them thus early for fodder, viz. by about the 20th of June, you may hope to have ploughed up the ground again by the beginning of July, and ſown thereon a crop of turnips.

Winter-vetches prepare the ground for a barley-crop, and why.

§. 8. It is admitted by all knowing perſons in huſbandry, that a good crop of winter-vetches enriches land more, and prepares it better for a crop of barley than a good crop of peas does.—One reaſon of this may be, becauſe a crop of winter-vetches covers the ground longer than peas do.—But another reaſon ſeems probable to me, becauſe honey-dews are bred and generated in great quantities in the joints of the ſtalks of winter-vetches, and in the foldings of their leaves (which incaſe the bud of the bloſſoms) partly by the exterior dews, partly by the exſudations therewith mixing, being condenſed by the heat of the ſun, and boiled into a ſyrup, which contains fixed ſalts, and are afterwards by great rains waſhed off the vetches, and carried into the earth, to it's great enrichment.

Good after a barley-crop.

§. 9. It is the general opinion of farmers I have talked with on this ſubject, that winter-vetches always do beſt after a barley-crop: I have tried them after oats with good ſucceſs.

Better after other corn than on a lay-ground if ſowed to one earth.

§. 10. I have found by experience, that if winter-vetches are ſowed on one earth, and on lay-ground, though clay-ground that turns up pretty mellow and rotten, yet they will, if a hot ſummer comes, be more apt to blight than winter-vetches ſowed on a clay-ground, which breaks ſmall, after two or three former crops have been taken from it: ſuch ground cloſes better to the roots.

§. 11. Far-

A wet ſpring makes vetches dear.

§. 11. Farmer William Sartain of Broughton in Wilts ſays, the rule in the vale for ſpring-vetches being dear is, when there is a wet ſpring, when, if the barley-land does not work well for a barley-crop, they like to fling in a crop of ſpring-vetches in order for a winter-crop of wheat at Michaelmaſs; and from this principle a wet ſpring has occaſioned ſuch a demand for ſpring-vetches that he has, in ſuch caſe, ſold them for ſeven ſhillings a buſhel.

Dry ſummers the ſame.

§. 12. As the drieſt ſummers make ſeed-vetches dear at Michaelmaſs, ſo they are more ſo in caſe of a bad ſummer for ſown graſſes, that is, in caſe the ſpring of the foregoing year was ſo dry that the ſown graſs-ſeeds did not come up well; for then, in the hill-country, the ſcarcity of graſs, made more ſcarce by a hot ſummer, muſt occaſion the ſcarcity of vetches.

Caution—to ſow them, if oats be dear.

§. 13. If a huſbandman finds by the courſe of the winter that oats are dear, and like to be dearer in ſummer, he is not wiſe, who takes not care to ſow a good quantity of goar-vetches in the ſpring, eſpecially if they are cheap.

Tufted-vetches a ſign of rich land.

§. 14. Vicia multiflora, apud Ray, vol. 1. fol. 903.—Anglice tufted-vetches.——Mr. Bobart of Oxford aſſures me, that whereſoever this vetch grows in the meadows, it is a ſign of the land being very rich.

Of ploughing in vetches. Vid. ſowing vetches.

§. 15. I have ſometimes known many quarters of goar-vetches ſowed only to the intent of ploughing them in: the beſt way is firſt to roll them, before you plough them, or elſe you could not make good work, that is to ſay, the way is to roll one land upwards, and the other land downwards, that ſo the plough need never to go againſt the grain, the vetches being firſt laid flat before the plough in the rolling.

I ſpoke to Mr. Biſhop of Dorſetſhire of the huſbandry of ſowing goar or ſummer-vetches, and ploughing them in inſtead of dunging.—He commended the way very much, and ſaid, in many countries, where they had more arable than they could dung, they had no way better than ſo to manage it; but doubtleſs the winter-vetches are more advantageous for that purpoſe, becauſe the ſummer-vetches would come up ſo late, that they could not plough it up again early enough to ſummer-fallow it, whereas the winter-vetches would come up ſo early, that the cattle might feed them down, and they would afterwards be got up high enough to be ploughed in;—but this huſbandry is for deep land; for in light land upon a rock, where the rock is but four inches beneath the ſurface of the land, the vetches ſo ſown would never come up.

If any think fit to ſow vetches for ploughing in under the furrow, in order to improve the land, I think it eaſy to prove, that winter-vetches are properer for that purpoſe than goar or ſummer-vetches are; for though goar-vetches run much groſſer, and in that reſpect would be better; yet, in regard they are tender, and will not endure being ſowed till ſpring, they cannot get to a ſufficient growth for ploughing in till towards Auguſt, by which time the vigour of the ſun, which ſhould precipitate their putrifaction by raiſing noble ſalts from them, will be ſo much abated that little can be effected that way; whereas winter-vetches being ſowed before winter, and having a root confirmed before ſpring to proceed on, will be forward enough to be ploughed in by a week or a fortnight in June, and the quantity of their ſalts, lying ſo much more under the power of the ſun to extract them, will amply compenſate the ground for want of the larger halm.

[b] The antients practiſed this huſbandry of ploughing in winter-vetches, eſteeming it equal to a coat of dung, as we learn from Columella.

Obſervation on the growth and bloſſoming of vetches.

§. 16. I took a view of my vetches in bloſſom to ſee in what different manner they bloſſomed from my peas (taken notice of before;) and I found, that whereas good peas, that blow well, have two bloſſoms on the ſame ſtalk, on divided pedeſtals; ſo, good vetches have two bloſſoms growing cloſe to the ſtalk at every joint.—I obſerved under the uppermoſt tuft of bloſſoms in ſome of the vetch-halm two bloſſoms at every joint of the four upper joints, and at ſome of the five upper joints; then three or four lower joints had but one a-piece, and the halm carried four or five joints lower, on each of which there were very ſmall woolly buds, but ſuch as might blow afterwards, if the weather proved favourable.—From whence I infer, that, if vetches have their complement of joints, they amount to fifteen, and, if they carry their complement of bloſſoms, there are two at each joint; I obſerved no more on any joint, and much of the halm had two bloſſoms only on the two upper joints, and but one on the joints beneath, and poſſibly left off bloſſoming at the fifth joint: again I obſerved, that many ſeventh and eighth joints carried two bloſſoms, when the uppermoſt had but one bloſſom on each, and I found many of the fallen or falling-off bloſſoms of the lower joints blighted. Note, this was but in white land.—In another field of vetches I afterwards obſerved but four or five joints in a halm, and but one or two of the uppermoſt joints to have two bloſſoms.

It was this year (1712) obſerved by many farmers, that the vetches kidded at the top and not at the bottom, that is, they run on, and ſpent many more joints than uſual without putting forth either bloſſom or kid:—I thought the peas alſo did the ſame—I am at a loſs how to aſſign the reaſon why vetches and peas ſhould ſome years run out into kid at the lower joints firſt, and other years leave many lower joints unfruitful; unleſs it be, that the bloſſoms being all formed in a cluſter, as before deſcribed, the cluſters in wet years run on ſo faſt and furiouſly into joints, that they paſs on too quick to make a due formation of the lowermoſt bloſſoms; by which means the unformed bud of the bloſſom, which nature deſigned for fruit, is converted into a falſe birth, and an imperfect eſſay; and ſo the ſame evil happens from bloſſom to bloſſom, and makes it late before this fury of the ſap is ſpent, and fruitful bloſſoms perfected.——Again,—when a very dry ſpring happens, as this year it did during the three latter weeks of April, and the whole month of May; it ſeems to me, that the buds of the lowermoſt bloſſoms of the cluſter, which doubtleſs are firſt formed in embrio, are ſtarved through drought; and ſo the joints, on which they ſhould have grown, are left naked; but by the coming of more favourable weather the upper joints prove fruitful; ſo that a due medium in the temperature of the year between drought and wet ſeems to me to be the moſt fruitful ſeaſon.—Again,—I have obſerved, when two or three joints have bloſſomed and kidded, and more bloſſoms, perhaps two or three gradations, remained unkidded, the ſeaſon of the year being early enough, and the weather at the time being warm enough to finiſh them into kids; yet, if a ſeaſon of cold rain then came, thoſe bloſſoms would not produce kids, becauſe, as it ſeems to me, a good medium or temperature of the air is neceſſary for that purpoſe, in order to digeſt the juices, which are chilled by cold rain, and dried up by hot burning weather.

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[b] Vice ſimi lupinum certe præſidium expeditiſſimum eſt, quod cum exili loco circa idus Septembris ſparſerit, et inaraverit, (which is ſowing under furrow) idque tempeſtive vomere vel ligone ſucciderit, vim optime ſtercorationis e hibebit; ſuccidi autem lupinum ſabuloſis locis oportet cum ſecundum florem, rubricoſis cum tertiam egerit: illic, dum tenerum eſt, convertitur, ut celeriter ipſum putreſcat, permiſceaturque gracili ſolo; hic jam robuſtius, quod ſolidiores glebas diutius ſuſtineat, et ſuſpendat, ut eæ ſolibus æſtivis vaporatæ reſolvantur. Columella, ſol. 109.—But it ſeems that advantage cannot be made of the lupine-vetch in England; becauſe it will die if ſowed before winter; and if ſowed in the ſpring, it will not be forward enough to anſwer theſe ends.

Of froſt ripening goar-vetches.

§. 17. Walking with a farmer in ſome goar-vetches in September (1700) they ſeemed very backward, whereupon I aſked him if he thought they would ever ripen for ſeed; he replied, when the froſts came they would ripen; by which he meant, that till then (the ſun now declining in it's ſtrength, and there being great dews and long nights) the halm would keep feeding on; but when the froſts came and checked the groſs nouriſhing of it, then the kids would fill better.

Vetches, when blighted, not ſo apt to open and ſhed.

§. 18. I was queſtioning whether ſome winter-vetches cut for ſeed ſhould not be brought in, leſt rain ſhould fall and make the kids open, many of them being dead-ripe;—but the farmers ſaid, no fear of that, for, tho' they might ſeem to be dead-ripe, yet they were alſo blighted, which is apparent by the ſmallneſs of the grain [and ſuch I obſerved them to be] and therefore their kids will be tough, and not ſo apt to open as at another time, when of the ſame ripeneſs.

Profit of vetches and broad-clover compared.

§. 19. After all that has been ſaid of the great profit ariſing from vetches, yet, if we compare it with that ariſing from broad-clover, we ſhall find the advantage on the ſide of the latter, viz.

Vetches	Sowing an acre of vetches at two buſhels per acre, and two ſhillings and ſix-pence per buſhel	0	5	0
	Ploughing and harrowing an acre	0	6	0
	Hacking or mowing	0	2	6
	Total	0	13	6
Broad-clover	Sowing twelve pound to an acre, at 3 d. per pound	0	3	0
	Mowing an acre	0	1	0
	Total	0	4	0
	The difference in favour of broad-clover is	0	9	6

The labour of carting, reeking, thatching, and ſowing are the ſame; but, if you buy the ſeed of each at market, the vetches are in carriage vaſtly greater than the clover; for a load of vetches, reckoning five quarters to a load, will ſow but twenty acres, whereas a ſack of clover will hold two hundred and fifty pounds, which will ſow more than twenty acres. Again, the ſecond year's crop of clover, (if you let it grow the ſecond year) is a very great profit beyond the rent of the ground;---ſo that there is no reaſon to ſow winter-vetches in any ground that will well bear broad-clover; for it is certain, every thing conſidered, there is near twenty ſhillings diſadvantage, communibus annis, by ſowing vetches in land that will bear clover.

REAPING and MOWING.

§. 1. [a] THE antients reaped their corn before it was full ripe, as Pliny informs us.

Of the time of cutting corn.

It is certain there are very great diſadvantages in letting ſome ſorts of corn ſtand till it is full-ripe before it be cut.—Firſt, both the chaff and the fodder are worſe,—and, if ſuch ripe corn takes wet, the increaſe in malt is loſt, if barley, it having already ſpent itſelf,—and if it be wheat, the flour is much the worſe, and the weight diminiſhed,—but if corn be cut greeniſh, it will bear a pretty deal of wet without damage, for it will not drink up the wet like corn full-ripe, but rather only take in ſo much as to be kindly fed by it;—but if any ſort of corn be blighted, the ſooner it is cut down, tho' but half ripe, the better, for nouriſhment can no more be conveyed to it by the ſtraw, whereas, by lying in gripp it will be fed:—it is like feeding ſick perſons with clyſters, when they can take no nouriſhment at their ſtomachs, or turning a child to weaning, when it will thrive no longer with the nurſe's milk.

To be cut before it is full-ripe.

Corn that is full of weeds ought to be cut three or four days ſooner than ordinary, that the weeds may have time to wither, and yet the corn not ſuffer by being over-ripe; whereas, if the corn in ſuch caſe be full-ripe, it will be liable to take damage by britting as well as loſs of colour, or by rain, if it be kept out till the weeds are withered.

Eſpecially weedy corn.

§. 2. If corn, or graſs is ſo long as to lie down, they obſerve to cut with the corn, not againſt the head of it that is falling;—but if it ſtand upright, they obſerve as much as poſſible always to cut croſs the furrows, and the ſame in meadows, if there be any furrows, that they may cut the bottoms; for, if they cut along the furrows, the riſing lands will carry the ſcythe over the bottoms, ſo that it will leave the graſs uncut.

Manner of cutting corn or graſs that is lodged.

§. 3. If corn comes in wet, or not well dried, though it will not take much harm in the mow, yet as ſoon as threſhed, and laid together on an heap,

Wet corn to be ſold as ſoon as threſhed.

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[a] Secandi tempus cum ſpica defloreſcere cœpit, atque roborari: ſecandum antequam inareſcat. Plin. fol. 314.

heap, it will in a week's time ſweat and cling together; and be as white with moldineſs as if flour had been ſtrewed on it,—ſuch corn therefore ought, as ſoon as threſhed, to be ſent to market, and ſold.

Corn is better for lying a day in ſwarth after it is cut.

§. 4. It is ſaid, for corn to lie in ſwarth a day is very good though a ſhower of rain ſhould come; for it makes it feel dry and ſlippery, and threſh the better;—and Mr. Edwards blamed a neighbouring farmer much for hurrying in his corn ſo faſt, if there was but any likelihood of a ſhower; whereas, ſaid he, a day's rain never did it harm, but rather good, and wheat after cut was the better for a wet day. But, ſaid farmer Biggs, there is nothing loſt by carrying it in before ſuch ſhower of rain may fall; for, tho' it will feel cold, yet, not having laid abroad to take the ſun and rain, it will not be ſhrunk ſo much as if it had done ſo, and the fewer grains will go to fill the buſhel, and that will make amends.

Not to make great barley or oat-cocks, and why.

§. 5. Mr. Edwards cautions me not to make great barley-cocks, nor great oat-cocks, but middling ones: if the corn be thick, ſaid he, the taſk-workers will be for making great cocks, which the men cannot pitch into the cart, when they take off the tops, unleſs they trample on the cocks, which makes the corn brit, eſpecially when dead-ripe.

In hot ſummers to employ the more reapers to make expedition.

§. 6. In hot ſummers you are to conſider, that wheat is plump, and full in berry, and the glumes or chaff ſtarky, and not tough, as in cold wet ſummers, whereby it holds the corn the cloſer, and you ought to man your harveſt accordingly by ſetting on in hot ſummers the more reapers; for ſuch corn, when ſcorched up by the ſun, and full in grain, will ſoon take a ſtain, and damage by wet, and brit, and be blown out by the wind: when you have it dead-ripe, and of a good colour, it is all you can deſire; therefore in ſuch caſe the leſs it lies abroad in gripp or ſhock the better; to which end the higher they cut the wheat, ſo as to cut the leſs graſs, the better; that it may be the ſooner in order for carting.

Why they leave a high ſtubble in Leiceſterſhire and Northamptonſhire.

§. 7. The chief reaſon, as it ſeems to me, why in Leiceſterſhire, Northamptonſhire, and ſuch deep lands the farmer cuts the wheat high from the ground, and leaves a high ſtubble, is becauſe in low vale countries, where the land is rich and deep, and incloſed countries, the wheat, after it is cut, and lies in gripp, does not lie ſo expoſed for the ſun and wind to dry the gripps after being ſogged with wet, as it does in the hill-country; therefore the higher the ſtubble is left the gripps are thereby born up the higher, and lie the hollower from the ground, and conſequently are the eaſier dried by the ſun and wind.—It is alſo to be remembered, that the fatter and richer the land is the ſooner the gripps will grow after they have taken wet, in caſe they lie on the naked ground, and ſooner than they would in ſuch caſe do in the hill-country, where the land is poor;—therefore it is very proper to leave the wheat-ſtubble the higher, that the gripps may thereby be born up from the ground; beſides, the ſhorter the ſheaves are made the more the barns will hold, and the uſe of the after-ſtubble, which makes excellent * elm, will compenſate the loſs of the ſtraw. In ſome places they mow it for drying malt.

§. 8. The

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* thatch.

§. 8. The forwarder any countries are in their harveſt, whether by the forwardneſs of the year, or the natural heat and warmth of the ſoil, ſo much the bolder may the huſband-man be in leaving his wheat the longer abroad in the field, to take it's airings, and grow mellow, which makes it threſh better and look finer: for example, when the wheat-harveſt falls out in the middle of July, or at leaſt before the latter end of it, as it did anno 1714, there can be little danger in letting the wheat lie abroad four or five days, or a week, in caſe it be not cut over-ripe, even tho' a rainy day or two ſhould come; for at that time of the year the ſun is ſo hot, the days ſo long, and the graſs ſo ſhort, and the dews for the moſt part ſo little, that the corn, tho' it has a good rain, ſoon grows dry; whereas, in the middle, or the latter end of Auguſt the rainy ſeaſon generally comes in, the dewy nights grow long, the graſs rough, and the ſun's drying-power much abated, ſo that, if rainy weather ſhould come, the wheat will be much more apt to grow.

The forwarder and warmer any country is, the longer the corn may lay in gripp.

§. 9. Red-ſtraw wheat ought not to ſtand till it is ſo ripe as white-ſtraw may do, becauſe the red-ſtraw wheat is much apter to brit, if wind ſhould come; therefore the common ſaying is, that red-ſtraw wheat muſt be gathered knot-green, that is, whilſt the knots in the ſtraw are green.

Red-ſtraw wheat to be cut greener than white-ſtraw.

Beyond Wincheſter they cut red-ſtraw wheat greeniſh to amazement, a fortnight earlier than we ſhould do, and let it lie in gripp a fortnight, often turning it; and for reaping, turning, and binding into ſheaves they pay ſix ſhillings per acre, whereas at Crux-Eaſton we pay four ſhillings,—but they think their's the beſt huſbandry.

§. 10. It is agreed, that wheat ſhould be cut ſooner for being blighted; becauſe the ſtraw of blighted wheat, by ſtanding till the corn is full-ripe, will become ſo brittle there would be no handling it. And it is farther agreed, that blighted wheat ſhould lie longer in gripp than other wheat that it may plim, which it requires more time to do: it will make it threſh better, and come the clearer from the hull.

Blighted wheat ſhould be the ſooner cut.

§. 11. In mowing, a blighted patch of corn is known as ſoon as the mowers put the ſcythes into it; for it is ſoft and tough, and they had as good cut againſt wool; beſides it is more-looſe, that is, looſe at root.

Blighted corn known by the mowers.

§. 12. Wheat deſigned for ſeed ought to be cut riper, or at leaſt to lie a longer time abroad in gripp or ſheaf than otherwiſe it need to do, or elſe, being for preſent threſhing, it will not come clean out of the ſtraw, and the ſofteſt grains will beat flat; but, if it be deſigned for a reek-ſtaffold, and for keeping, it will by lying and ſweating in the mow, tho' carried in ſomewhat greeniſh, and without lying in gripp or ſheaf, come out of the ſtraw, and threſh very well.

Wheat for ſeed ſhould be cut riper.

It is certain, that the gripps of wheat, tho' laid as light and hollow as poſſible, will by the weight of the ears fall to the ground, and take harm, if ſuffered to lie long out in wet weather; though the ear of the gripp be ſet hollow, yet it will fall lower than the root-end of the ſtraw.

Straw worſe for lying out.

§. 13. Though moſt corn is the better for lying in ſwarth or gripps to take the dews, yet the ſtraw is the worſe for it for fodder, except it was cut before it was ripe, and only lie till ſufficiently ripened to be carried in.

In hot dry ſummers wheat need not lie long in gripp, and why.

§. 14. Take notice,—in hot dry ſummers, when corn ripens fully, and it's own virtue gives it a colour, and plumps up the berry; there is no need to let wheat lie out in gripp before it is ſheaved, nor in ſheaf, as you would do in a cold ſummer, unleſs it be very graſſy or weedy; but in cold ſummers the wheat is horny, and wants a colour; and the berry is thin and wants to be plumped; and the chaff of the cheſſes is clung, and wants to be mellowed in order to make it threſh the better: whereas in good and fruitful years the grain is full and ſwells the chaff, even till it opens, and ſo the wet will ſoak in the ſooner, and ſtain the colour of the wheat; and in ſuch good years it ought to be conſidered, that the ears are heavy, and, when they are in ſhock, they ſpread and hang over, being lop-heavy, whereby the ſheaf opens wider, and lets the rain into the bonds ſooner than in cold ſummers, when, the wheat being light, the ears in the ſhock ſtand more upright, and cloſer together.

Caution—to turn the gripps.

§. 15. It is moſt adviſeable to turn gripps of wheat lying out very early after being cut down, in order to get them dry as ſoon as poſſible; by this means you keep them the longer from growing, in caſe of rain; for when gripps have lain ſome time ſogged with wet, if dripping weather, or only driving miſts ſhould continue, all the art imaginable cannot prevent their growing.

Not to gripp up the wheat too early in the day, in a hill-country.

§. 16. In a hill-country, eſpecially where there is cold clay-land, ſingular regard ought to be had in harveſt-time, not to gripp up the wheat into ſheaves too early in the day; for in ſuch a country the gripps take ſo great a damp by having laid on the ground, that, tho' the ſtraw, and chaffy ears may ſeem to be dry, when the dew is firſt gone off, and after the ſun may have ſhined an hour or two on the gripps, yet there will remain an inward dampneſs in the corn, and in the inſide of the ſtraw, which being ſo reeked up will come damp from the reek at threſhing-time.—Therefore the afternoon is certainly beſt for gripping and binding into ſheaves, but ſo that they may be finiſhed before the heat of the day is over; yet the bonds ought to be laid in the morning, that they may not crack.—My opinion farther is, that in ſuch a country corn can never be better houſed, if thorough ripe, and hard, and not weedy, than by gripping and carting as faſt as it is cut down; for the dampneſs it takes by lying on the ground in the cold nights is not ſo eaſily recovered.

To carry as ſoon as reaped.

Of binding.

§. 17. The farmers do not always look well after the binding up their ſheaves, but ſuffer the reapers, for diſpatch, to bind the bonds juſt underneath the ears, inſtead of binding them at the other end; the conſequence of which is, that they will hardly hold together to be flung into the cart at harveſt, and will certainly be in great danger of falling to pieces before threſhing-time,

I was telling one of my harveſt women, that ſhe muſt rake oats for me on the morrow morning; ſhe replied, it muſt be after the dew was off the ground, for till that time ſhe ſhould be making bonds for the ſheaves ſhe had gripped for the farmer; for after the dew was off they could not be made.—I aſked her why; ſhe ſaid, the ſtraw would not twiſt after the ſun was up, but would be brittle, and break off below the ears.

It rained in the morning while my wheat lay in gripp, but ſeeming to hold up a little, I told one of my reapers, he might make bonds. He replied, unleſs it was like to be dry it was to no purpoſe to make bonds; for, when the bonds are made, they muſt lay a gripp or two on them to keep them in their places, otherwiſe the heat of the ſun will make them untwiſt; and therefore, unleſs it were likely to be fair, it is improper to lay the gripps upon the bonds, for the bonds being preſſed down will grow ſooner than any other corn, if rain ſhould come, becauſe they lying undermoſt cannot dry.

Sheaves ought not to be bound up wet; if they be, they will be moldy: tho' the bonds muſt be made in the morning-dew, yet the ſheaves ought not to be bound up till perfectly dry.

The reapers were complaining, the weather was ſo hot, that their bonds laid in the morning would not hold at noon, when they came to bind; but, ſaid they, old Cole's held; for he turned three or four ſtubble or bottom-ends of the ſtraw to the ears of the bond, which made them hold, they being thereby tougher, greener, and ſtronger.

If in harveſt-time you foreſee a little rain, it is beſt to gripp, and bind up into ſheaves, becauſe a little rain will ſo wet the grippings, that they cannot be bound up, and it may hold ſo, on and off, till greater rains come, but the ſheaves being bound will ſoon be dry; but if you foreſee a hard rain, it is better not to bind up into ſheaves, for the ſheaves will then be wet to the bonds, and muſt all be opened again.

Driving wind with rain the worſt weather for the wheat-ſheaves.

§. 18. If rain comes in harveſt-time with a driving wind, it is the moſt dangerous of any weather for ſheaves of wheat, and for ſheaves that are wet to the bonds it is worſe, as all farmers do agree, than down-right ſoaking rain.

Of making ſmall ſheaves in a wet harveſt.

§. 19. In a wet harveſt, there is this benefit in making ſmall ſheaves, that being thinner at the top, and falling cloſer, the rain does not fall down into the middle of them, and ſo go through them into the bonds, as it is apt to do in great ſheaves, which lie broader, and take a larger compaſs.

For weedy corn.

Care ought to be taken that the ſheaves are made ſmall, in caſe you are obliged to gripp and bind up wheat that is weedy, or thiſtly, into ſheaves, as for particular reaſons you may be, viz. for fear of rain, or on a Saturday-night becauſe you fear the weather on Sunday, that ſo the air, wind, and ſun may have the greater power to dry them, which they could not do, if they were made large.

To lay the ſheaves flat the firſt night.

§. 20. Mr. Whiſtler and Mr. Edwards, men of very good judgment in farming matters, were of opinion that it was beſt the night after the wheat was bound, if the weather was not catching, to lay the ſheaves, one by one, flat on the ground, whereby the ſtraw would cloſe together, and ſtand with the ears ſtiff and upright, and not be apt to lay open, and then five or ſix ſheaves being put into ſhock would abundantly better keep out the rain.

Not to lay the ears in the furrows.

§. 21. Some of the reapers had laid the ears of the grippings in the furrows of the lands, and the halm-end out, whereas they ought to have laid the ſtraw-end in the furrows, and the ears out, and then the ears would have ſtood ſloping-up, and have lain dry, though rain had come, but the other way it would quickly have grown,—and ſo I found it to do.

Of cocking wheat in Wilts.

§. 22. In Hampſhire they never cock the wheat in the field, as they do in Wiltſhire, whereby they may leave it out a month without damage; and, if they did ſo, the wheat would threſh much the better, for the air dries it; whereas, when carried forthwith into the barn, it is tough, and ſticks to the chaff.

In making the wheat-pooks in Wiltſhire the ſheaves are ſet with the ears uppermoſt in the firſt circle, and ſo on in every rundle, till at length it draws into a point; and then a ſheaf is opened and turned with the ears downward, like a ſhackle for a hive; for an ear turned downwards will not grow, nor take wet by half a year's wet weather, and the bottom of the ſheaf being broader than the top, every uppermoſt circle hangs over the ſheaves of the undermoſt circle, like the eaves of an houſe.—In a pook may be put a load or two; it is a very good way to ſecure corn againſt rain, and to give the weeds that may be amongſt it a drying time.—In my opinion however this method is not to be uſed where the wheat is deſigned for a ſtaffold, becauſe, if the weather prove wet, mice will run thither for ſhelter, and be carried in with the pooks.—Farmer Miles ſays, in that faſhion, without thatching, they make wheat-reeks in the Iſle of Wight.

Caution--regarding the management of the ſhocks in wet weather.

§. 23. In wet harveſts, I adviſe, when the weather clears up, to ſend ſome of the moſt diligent and ſkilful perſons into the field to ſearch the tythings of ſheaves, and to obſerve well which lie moſt on the weather-ſide, and ſtand moſt hollow, and open at top, and to remove all ſuch together by themſelves, and place them to ſuch advantage, that the ſun and wind may beſt go through them, moving them off from the ſides of hedges, &c. and taking up ſuch ſheaves as may be blown down.

After rainy weather, tho' the wet ſhould not have gone to the bonds of the ſheaves, yet it is good, when dry weather comes, to ſet the ſheaves of every tything apart, ſo that the air may come to every ſheaf, and particularly to take care to turn the weather-ſide of each ſheaf to the wind to dry the ſooner; for tho' the wet may not have gone to the bonds, yet the ſheaves are inwardly cold and damp, but will by this method be much the ſooner fit to be carted.

Damage from opening the ſheaves to dry them.

§. 24. My next neighbour, anno 1696, unſheafed ſome of his wheat to dry it, and opened it, and turned it ſo often, that the ears broke off, whereby he loſt half his corn;—caution therefore ought to be uſed in this caſe, leſt by curing one evil we create a worſe.

Wheat, if wet at bond only, will be damaged in the reek.

§. 25. A ſmart ſhower of rain fell on my wheat-ſheaves, and it was thought it went down to the bonds; whereupon, the next day being fair, the men took apart each tything, and ſet the ſhocks upright at ſome diſtance aſunder, ſpreading open the ears of the ſhock to let in the ſun and air ;--but afterwards my bailiff found that the rain had gone through the bonds, ſo that he was for unbinding them, and opening them to the ſun ;—for he argued, that if the inſide of the ſheaves were but wettiſh only, and from the ear to the bond were dry, ſuch ſheaves would grow moldy in the reek, and ſtrike ſuch a damp, that would cauſe many ears to grow, and therefore he adviſed to open them.—I did open them, and found them to be dampiſh, and ſome of them wet beyond the bonds : this was done to ſix load of wheat, and the ſheaves were bound up again without much loſs of time.

§. 26. One of my reapers, when he had made up ſome wheat into ſheaves, the wheat being long-eared and lop-heavy, ſaid, rain had not need meet with thoſe ſheaves before they were carried home.—I aſked him why ſo ; he ſaid, becauſe the ears being long and heavy were buſsle-headed,--that is, did hang their heads downward into the ſheaf, ſo that (in caſe a rain ſhould run down to the bonds) neither ſun nor wind could enter in to dry them, whereas, ſaid he, when the ears are ſhort, and not heavy, they ſtand upright and hollow, ſo that the ſun, and the air may eaſily dry them.

Wheat long-eared and lop-heavy ſhould be carted ſoon for fear of wet.

§. 27. I ordered my mowers to ſet their cradles down as cloſe to their ſcythes as they could, for the benefit of the ſwarths, the barley being very ſhort ; if they had not done ſo, they had loſt half the corn ; but their cradles carried the ſhort barley together in a ſwarth abundantly the better, by which means it might be raked with leſs loſs.—N. B. To ſee that other mowers do the ſame in ſuch caſe.

Caution in mowing corn.

§. 28. If one cuts graſs, where ſtones are, with a new ſcythe, and it ſhould ſtrike againſt a ſtone, the ſcythe will break out into flakes, but an old ſcythe that has been ſeaſoned will only be blunted, and may eaſily be ground out again.

Cut graſs in ſtony ground with an old ſcythe.

§. 29. If corn harles or lodges, a ſcythe cannot carry a cradle, becauſe the fingers of it will be pulled to pieces by the harled corn in drawing the ſcythe back ; but in that caſe, a bow on the ſcythe is moſt proper, which will carry the ſwarth away before it all together.

A ſcythe for cutting lodged corn.

§. 30. The thinner and poorer barley and oats are, and the weaker in ſtraw, they ought to be cut a little the ſooner, and lie in ſwarth ; for otherwiſe the ſtraw, if they are full ripe, will not ſtand againſt the ſcythe.

Thin and weak barley and oats ſhould be cut the ſooner.

§. 31. I ſowed broad-clover with barley, and, by all the country-men's judgment, it was deemed proper to mow this barley a week ſooner than otherwiſe it need to have been, becauſe the clover grew up rank, and it was agreed, that, if the barley ſtood till it was full-ripe, or but near it, as the clover would require four or five hot days to dry it before it could be houſed with the barley, it would in that time, in caſe two or three days rain ſhould fall, be turned black, whereas, being cut thus early, it would take no damage by ſuch weather, but require to ſtay abroad as long as the clover.

If clover be rank in barley, the barley ſhould be ſooner cut.

§. 32. I had barley this year (1702) knee-bent in a very extraordinary manner, and, being dead-ripe, it was crumpled down, and harled by contrary winds ;

Knee-bent barley to be mowed with a ſhort ſcythe.

winds; I added my own men to the mowers for diſpatch; but my men having only graſs-ſcythes, which are not ſo long as the others, could not diſpatch like them;—but farmer Biggs and farmer Knapp ſaid, that in this caſe the ſhorter ſcythes were more profitable to mow with than the others, and miſſed leſs of the corn.

Better mow than feed rank barley.

§. 33. Barley has been ſo rank in ſome places in a wet ſpring that it has been thought fit to mow it, and in ſuch caſe it may be better to mow it than to feed it, becauſe the ſcythe only takes off the rankeſt, but the ſheep feed upon all indifferently.

Of letting barley lie out in ſwarth.

§. 34. This year (1702) the weather being encouraging, I left out barley five or ſix days in ſwarth, which, though both blighted and edge-grown, plimmed, and gained very near as good a colour as the beſt.

Benefit of turning the barley ſwarths in wet weather.

§. 35. The 30th of Auguſt (anno 1708) I cut barley from day to day, and continued to do ſo for a week; from the 30th of Auguſt, for three weeks together, we had every day rain, more or leſs, but moſt of the time rain fell plentifully every day.—I ordered my barley in ſwarth to be turned every other day during theſe three weeks, to keep it from growing; and though the ſwarths during this time, that lay uppermoſt to the air, were hardly dry for any ſix hours together,—and the undermoſt barley of the ſwarths, which lay next the earth, was generally ſogged every day, and dungiſh till turned, as aboveſaid, yet I had none of my barley grew.—This was chiefly owing to the late ſeaſon of the year before our barley ripened, and the continued cold rains, which did not much forward the growing of the barley, as they would have done, had the harveſt been forwarder; for, had the rain been accompanied with hot ſun and glooms between, it would in half the time have made it grow.—I mention this, that in ſuch caſe, when ſuch a year may happen again, I need not be frightened, as we all were this year: in our hill-country the winds alſo contributed much to ſave us.

Oats on a ſide-land to be mowed earlier than on a flat.

§. 36. The firſt year that I took one hundred and forty acres into my own hands, I had the ſide-lands ſowed to oats.—It was agreed by every body, that thoſe oats ought to be mowed two or three days ſooner than if they were on a plain, becauſe, ſay they, if you let them be as ripe there as in a plain one ſhould do, the ſtraws will be ſo hard and dry that the ſcythe will ſkim over them.—The reaſon of this is, becauſe in ſuch ground a man has not ſo good a ſtand, nor can put that ſtrength to the ſcythe, his ſwing being weaker, as he might do in a plain, and ſo the ſtraw yields and bends.—Two acres of oats mowed per day in ſuch land is accounted as good a day's work as three acres in plain land.

Peas hurt by mowing.

§. 37. My labourers came from mowing vetches to mow peas, not having their hackers with them, and they were loth to go home for them for a piece of a day: I ſoon came to them, and found that the ſcythe made great waſte, and cut off abundance of the kids in the middle,—and they themſelves could not but be aſhamed of their work. I mention this, becauſe I am told it is the cuſtom in ſome parts of England to mow peas.

Peas plucked up in light land.

§. 38. I am told, that between Caln and Chippenham the land is almoſt as light as aſhes, and of about ſix ſhillings per acre, and that there they neither mow nor hack their peas, but pluck them up.—Quære, whether this was not, for the moſt part, the condition of the eaſtern-country-land, and whether there wool will not pull off better than with us.

The blue or green pea for boiling ſhould be cut early.

§. 39. The blue pea, or green pea, which is for boiling, is to be cut green, when the peas are thoroughly full-kidded, before the upper ſide of the kids toward the ſun be turned, as they will turn white; for then that whitiſh half will not boil well, nor the peas ſell in the market for boiling.—An old experienced farmer told me this, whereupon I went and gathered ſome of my own peas, which I thought not ripe enough to cut by ten days, according as the partridge-peas are cut, and when I ſhewed the kids, he ſaid, by all means, it was fit they ſhould be cut.—I wondered at it, and aſked if they would not turn black; he ſaid, no, they would keep their green colour, though wet weather ſhould come upon the halm, and turn it as black as a hat.—But they ought not to be threſhed any time before they are boiled, or ſowed; for in four or five weeks they will finnow.

Partridge-peas, if cut green, turn black.

§. 40. Mr. Jackſon of Tackham aſſured me, that he ſowed partridge-peas, which by having been cut green were turned as black as a hat, and yet he had as good a crop as he ever had: this crop I myſelf ſaw, and they were very good peas.

If vetches do not kid well they ſhould be ſooner cut.

§. 41. The different opinions of my two ox-hinds divided me much about the ſeaſon of cutting my winter-vetches.—The one was for having me cut them when near full-kidded, and ſeemed moſt to regard the kids.—The other regarded the halm more than the kids, and ſaid, the horſes were as fond of the halm, if taken in ſeaſon, as of the kids, therefore the halm ought not to be ſuffered, if one can help it, to rot on the ground.—Farmers Elton and Oliver agreed, that if the vetches fell out of the kids into the manger, the horſes would not eat them, and ſaid, if vetches in the grain were ſet before horſes, they would not care for them; ſo ſaid Mr. Edwards's ſervant;—but Elton added, there was moderation on both ſides to be regarded, and extreams to be avoided, but, if the vetches did not kid well, he thought the beſt way was, eſpecially if the ſeaſon was like to be dry, to cut them the ſooner, for ſo they would make the better fodder.

Vetches ſhould lay out before given to horſes.

§. 42. My winter-vetches were very well kidded, and almoſt fit to be cut, and houſed for winter-fodder.—Several farmers were of opinion, they were then in very good order for horſes; but if, whilſt I gave them green to my horſes, they were cut and laid on the ground two or three days to wither a little, they aſſured me they would be more hearty; for it would take ſomewhat from their groſsneſs.

Time of cutting vetches.

§. 43. When you cut winter-vetches for winter-fodder, in the timing it you ought to conſider, that, when they are cut green, they require a long time to dry in, during which, eſpecially if the weather be wet, the vetches will continue growing, and the kids, tho' lean when you cut them, and but two rinds, yet will fill out, and almoſt perfect their ſeed in the fortnight's time that they muſt, for the moſt part, lie abroad; therefore of whatever ſize you would have the berry of, you muſt cut the vetches at leaſt a week before they come to that growth.—You ought always to cut them ſo early that there may be no danger of their kids ſplitting, and ſhedding in the foddering with them, which they will do, in caſe you ſuffer them to be near ripe; beſides, the riper you ſuffer the ſeed to be the coarſer will the ſtraw or halm be at the bottom, eſpecially if the vetches through a wet ſummer are grown groſs.

Vetches ſhort and dead ripe cannot be mowed.

§. 44. If vetches are ſhort, as being blighted, or otherwiſe, and dead-ripe, it will be difficult to hack them, but impoſſible to mow them, becauſe their halm, which will be hard and dry, having no weight to bear againſt the ſcythe, will yield, and the ſcythe will ſlip over them.

Graſs mows beſt at noon.

§. 45. When I was mowing my meadows at Eaſton (anno 1701), about nine in the morning, one of my mowers began to complain, that about this hour, when the dew went off the graſs, was the worſt time of all the day for mowing graſs; and ſo it is, ſaid he, for corn too.—How, ſaid I, worſe than at noon, and after? he ſaid, yes.—Then I went to the other mowers, who were mowing in another part of the meads, and aſked them at what time of the day the graſs mowed beſt; they all ſaid at noon. Why, ſaid I, your fellow ſays —, &c. (as above) and therefore before the dew is gone off, I thought had been the beſt time.—They ſaid, no; a hard ſcythe will cut the graſs beſt at noon, but a ſoft ſcythe while the dew is on the graſs.—Why then, ſaid I, do they ſay (if noon, which is in the heat of the day, be beſt) that the graſs cuts beſt after rain? for in this dry time we have at preſent, I hear you complain of the ill mowing of the graſs.—They ſaid, that is, becauſe the drought has lain ſo long upon the ground as to make it hard, ſo that when the ſcythe cuts cloſe, it dances upon every little roughneſs, whereas, was the ground a little moiſtened with rain, the ſcythe would cut it, and every little excreſcence would be pared off; and then the ſcythe would not ſcratch ſo often, nor be ſo often blunted.—I went to the firſt, and aſked him of the truth of what they ſaid, and he ſaid it was ſo.—So that it ſeems they were both in the right; and though graſs mows beſt at noon, yet it mows worſt, when the dew is juſt going off: the reaſon they could not give me, but I ſuppoſe, that on the firſt going off of the dew the graſs is not ſtiff enough to ſtand ſo ſtrong againſt the ſcythe, nor ſo heavy, nor weighty as when it was loaded with dew, which made it lie cloſe; yet at noon, when the graſs was become dry and ſtiff, it ſtood cloſer than when the dew was on it.

Better to mow by the day than the acre in the hill-country.

§. 46. In our hill-country, where graſs is ſhort, I hold it beſt to give one ſhilling and ſix-pence per day for mowing; I rather chooſe to do ſo than to agree by the acre, that the work may be more carefully done.

If graſs be not fed clean againſt ſpring, the old rowet damages the graſs and blunts the ſcythe.

§. 47. As one of my labourers, an old experienced hind, was mowing, he every now and then complained of the old rowet, that hindered him, and deadened his ſcythe.—It was ſome time before I knew what he meant; at length he pulled up ſome ſpiry tough capillary graſs, about three inches long, which was the old winter-graſs: It ſeems I had not fed the graſs down ſo low as I ſhould have done againſt ſpring, which did harm to the young graſs that was to be cut; for, if that had been fed better, the young graſs would have come away thicker, and not have choaked up the ſcythe. He compared it to the young wool, which (when ſheep have been pretty well kept in winter, and then checked in the ſpring) comes up under the firſt wool, and deadens the ſhears, ſo as to make it troubleſome to cut with them.

§. 48. I was mowing broad-clover, where ſome of it in gully-places was ſhort, and I propoſed to miſs thoſe pieces, and not mow them, but the mowers were againſt it, and ſaid, the ſhorteſt, when mowed, would come away much better for mowing, and fill towards the next crop.—Mr. Edwards being preſent ſaid, that farmer Elton had once ſome poor patches in his mead, which, being ſhort, he would not be at the charge of mowing, but thoſe patches were thinner for it afterwards in future crops.

Graſs, tho' thin, ſhould be cut.

RAKING.

§. 1. THOUGH mowing and raking of corn are the ſame price per acre, yet you muſt have double the number of rakers that you have of mowers, in order to make equal diſpatch, becauſe the mowers have not the lets and hindrances that the rakers have: the mowers can continue mowing in moderate rain, as well as begin early in the morning, whereas the rakers are ſtopped with every ſhower, and commonly loſe two or three hours in the morning in ſtaying till the dew be off the ground.

Two rakers to one mower.

§. 2. If the land be ſtony, and the ſtraw of the barley ſhort, it will do well to rake up the barley and cock it ſoon, leſt rain ſhould come; for rain will ſo beat the barley into the ground, that there will be no raking up half of it.

Rake the barley and cock it ſoon in ſtony land.

§. 3. Anno 1701, my broad-clover came up with my barley ſo high, that they were forced to cut the barley under the ear: I thought the barley would rake much the better for the broad-clover, inaſmuch as it would be kept up from ſinking into the ground.—But the mowers ſaid, no; that the broad-clover was ſo long and thick, and the ſtubble left ſo high, that it would be hard work to run the fork along under the ſwarths, as alſo to draw the teeth of the rake through the mattings of the graſs.—I believe therefore it would be more for the farmer's intereſt to employ men at this taſk than women.

To employ men rather than women at raking barley.

§. 4. One perſon is counted ſufficient to rake oats after the cart; unleſs in a very high wind, but to rake after the barley-cart, be the wind never ſo ſtill, two perſons are always reckoned neceſſary.

One to rake oats after the cart—two to rake barley.

CARRYING of CORN.

When barley is ſhort, two pitchers to one loader.

§. 1. WHEN the barley-ſtraw runs very ſhort, it is good huſbandry to have two pitchers to one loader in the field; otherwiſe time will be loſt.

Wet corn to be put round the ſides of the barn.

§. 2. If a load or two of corn comes in wet, in caſe your barns are boarded, it will do well to ſcatter it round about the ſides of the barn.

Blighted wheat to be carried as ſoon as can be.

§. 3. If wheat be ſtruck with the blight, the ſtraw in ſuch caſe is hollow and ſpungy, and eaſily drinks in wet; therefore, if the corn be tolerably dry, and in order, and the weather be anywiſe ſuſpicious, it is adviſable to get it into the barn as faſt as poſſible; for if ſuch looſe ſtraw ſhould once ſoak in wet, and ſhowery weather ſhould follow, it will be much longer before it can be got dry, and fit to be carted, than other corn.

To carry oats in rimy weather.

§. 4. A rimy day is better to carry home oats in than a hot day; for in hot dry weather the oat-ſtraw will be ſo ſleek, that it will be troubleſome loading and tying it together, ſo as not to ſlide off from the cart, or not to ſwag to the ſide the cart may lean on, and ſo over-turn it.—Again, oats will be tougher, and leſs apt to brit in carrying on a rimy day than on a hot burning day.

Carry light loads near home, and larger farther off.

§. 5. Mr. Hillman, and another experienced farmer, ſaid, it was moſt profitable at harveſt to carry light loads near home, and bigger loads farther off, not only becauſe, in caſe it be near home, the larger loads take up more time in binding them, but alſo becauſe one man can pitch down at the barn faſter than two men in the field can pitch up, eſpecially after the load riſes to a height.

THRESHING.

Threſhing-floors of the antients, and in hot countries.

§. 1. IT appears from Hammond, on Matt. iii. 12.—the Jews threſhing-floors were on the mountains, and open fields, where the wind could have free acceſs, and ſo it is, he ſays, in ſome parts of Spain.—By Varro it appears the threſhing-floors were generally uncovered, yet ſome were otherwiſe, but the uncovered threſhing-floors were laid round that the water might run off. Lib. 1. c. 55.

[a] In ſome places they threſhed out their corn with flails on a floor, in others they trod it out with mares, and in others beat it out with poles.

Uſed chaff or ſtraw in their floors.

§. 2. It ſeems the antients had ſome uſe for chaff, viz. in making of floors, though palea ſignifies indeed ſtraw as well as chaff. Cato, fo. 18.

§. 3. In

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[a] Meſſis ipſa alibi tribulis in area, alibi equarum greſſibus exteritur, alibi perticis flagellatur. Plin. lib. 18. c. 30.

§. 3. [b] In countries ſubject to rain they had their barns contiguous to their threſhing-floors, and their floors alſo were covered, of which ſee Varro, fo. 34.—Some, he ſays, fortified the ſides of their floors with ſtone, others made an entire ſtone pavement; he agrees with Cato, that rubbing the floors with the lees of oil was neceſſary to prevent the growth of weeds in them, and a protection againſt vermin, particularly ants and moles, to which oil is poiſon.

Earthen floors in Leiceſterſhire.

§. 4. Mr. Tate was finding fault with the ſtone and earthen floors of Leiceſterſhire, and ſaid the farmers were wedded to them, notwithſtanding one Sturt (as I think he named him) who lived at Wickham, and had been the greateſt commiſſioner in England for buying up corn, had aſſured him, that thoſe floors communicated ſuch dampneſs to the wheat, that it was the worſe, either for keeping or exporting, by ſix-pence in the buſhel.

Threſhing in hot countries.

§. 5. In Italy, and other hot countries, they uſually threſh and winnow their corn as ſoon as they have cut it down, or at leaſt a great part of it, and this is done, before they bring it into the houſe, on a floor made in the open air.—Being kept poor they have but very ſmall farms;—and I am apt to believe that in Judea they did thus, becauſe their poſſeſſions were cantoned into ſo ſmall diviſions. See Ray, fo. 402.

Of the threſher's ſhoes.

§. 6. Iron-clayted ſhoes do not well to threſh wheat in, eſpecially if it be new corn; for ſuch ſhoes ſquat and bruiſe it much: a threſher's ſhoes ſhould by right be ſoled with an old hat.

Two threſhers require a larger floor for barley than for peas.

§. 7. One of my ſervants being threſhing peas, I aſked him whether the floor was not too ſmall for two men to threſh in together; he ſaid, no, not to threſh peas in, but it was too ſmall for two men to threſh barley, or other corn in, becauſe the flail makes the ſtraw of light corn fly away, and the threſhers muſt keep moving to follow it, and ſo would be ſtreightened for room; but a wad of peas, when laid down on the floor, not only lies heavy, but harles together alſo, and lies for the moſt part in the ſame place it was at firſt laid down in, and ſo the threſhers need not keep moving, but ſtand in one ſtation, by which means they will not ſtand in each other's way.

Of the quantity of corn to be threſhed in a day.

§. 8. A good threſher aſſured me, that twelve buſhels of oats were counted a good day's threſhing, but he had lately for ſeveral days together threſhed fourteen buſhels, and winnowed them; but thoſe oats yielded extraordinary well. He ſaid likewiſe, that twelve buſhels of barley was a good day's threſhing, and in the country the common price was eight-pence per quarter; but five or ſix buſhels of wheat was a very good day's threſhing, and, in caſe the corn was clung, and yielded ill, ſometimes three buſhels was as much as could be threſhed in a day.

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[b] Amurca perfundere ſolent areas, ea enim herbarum eſt inimica, et formicarum, et talparum venenum; quidam aream ut habeant ſolidam, muniunt lapide, aut etiam faciunt pavimentum: nonnulli etiam tegunt areas ut in Bagiennis, quod ibi ſæpe id temporis anni oriuntur nimbi. Varro, fo. 46.

Areas amurcâ conſpergito, ſic herbæ non naſcentur. Cato, fol. 14.

Quatenus ad aream; huic autem nubilarium applicari debet, maximeque in Italia, propter inconſtantiam cœli, quo collata ſemitrita frumenta protegantur, ſi ſubitaneus imber inceſſerit: nam in tranſmarinis quibuſdam regionibus, ubi æſtas pluviâ caret, ſupervacuum eſt. Columella, lib 1 fo. 93.

It depends on the ſoil the corn grows on.

I have for ſome time been uneaſy about the ſmall quantity of wheat my threſhers uſed to threſh in a day: my beſt threſher ſeldom in any year exceeded a ſack in a day: I had this day (November 5th anno 1714) a ſerious argument with him about it, another good threſher being preſent.—The firſt perſiſted, that it was well known to the threſhers of the country that they could as eaſily threſh ſix buſhels of wheat in a day at Netherton-farm, it being a warm gravelly bottom, as they could threſh four buſhels in a day at Aſhmonſworth, or Crux-Eaſton; for on ſuch cold lands the corn threſhed tough.—The other ſaid, he had threſhed at Netherton-farm for two or three years, and that they commonly reckoned the ſame difference in threſhing, as aboveſaid, between the wheat of that farm and the wheat of the cold hill-land of Faccomb, where the village ſtands.—So that the difference between the cold hill-lands, and the warm vale-lands, with regard to threſhing, I now look on as a ſettled point.—And note,—in ſuch a cold hill-country as our's at Crux-Eaſton is, men threſh harder to perform their day's-work than in the vale, where the corn threſhes eaſier, becauſe the ſtroke of the flail muſt in ſuch cold countries be forced down ſtronger, to beat out the corn, than in the vales, where a lighter ſtroke does more work.

It is to be conſidered, that Faccomb, and my neighbours wheat yields more in a day's threſhing than in the clay-lands, becauſe their lands being lighter, the ſtraw runs ſhorter, and conſequently more ſheaves are laid on the floor, and the more ears of corn muſt therefore be laid there; whereas on my clay-land the ſtraw runs longer, and conſequently the fewer ſheaves and ears of corn are laid on the floor to fill it.

Wheat to be threſhed in dry weather.

§. 9. One week in particular our wheat yielded very little flour in grinding, and had abundance of bran, of which the miller alſo complained.—My threſher aſſured me, the reaſon was, becauſe I had threſhed that wheat whilſt the weather was damp; for, ſaid he, then the wheat will be cold, and will not grind well, notwithſtanding the weather be ever ſo dry afterwards; but if threſhed dry, and put it into ſacks, it will not afterwards grow heavy, and yet if threſhed in open weather, and then put into ſacks, it will be muſty in leſs than three weeks time.

Of threſhing barley.

§. 10. The beards of the barley will come off much better in threſhing for the ſwarth taking the dew.

Of threſhing vetches when ſoft with damp.

§. 11. I had a mind to threſh out ſome vetches in the field; they were ripe, but a little ſoft, on which, intending immediately to ſow them, I aſked the farmer (ſhewing him them) if they were not too ſoft to threſh; he ſaid, all the danger was that, if threſhed on a floor, the flail and the man's feet would bruiſe and break them, but to threſh them on a hurdle, with a cloth, would do well.

Rye or clover-hay beſt threſhed in the field.

§. 12. I was aſking a good farmer in my neighbourhood, whether it was beſt to carry rye-graſs, or clover-hay for ſeed, to the barn, or the reek, and threſh it out afterwards, or to threſh it out in the field at hay-making; the farmer ſaid, they did it both ways, but, ſaid he, I think the beſt way is to threſh it out in the field; for, if the ſun be hot, it will brit very much, and there will be great loſs in carrying it home, eſpecially if you go through narrow lanes, and then it will ſlack and give in the mow, ſo that it will threſh but ordinarily, whereas, if threſhed in the field about noon, when the hay is dry, one man will threſh as much as three men can do the other way.

Caution—to ſkreen all ſeed-corn.

§. 13. [c] As my bailiff was winnowing peas for ſeed, I obſerved a vaſt quantity of charlock among them; he ſaid, it could not be helped; for charlock was a ſeed that the fan would not ſeparate from any ſort of corn, but it might be done with the ſkreen.—So I ordered them to be ſkreened before they were ſowed, and I adviſe the ſame to be done with all ſorts of corn deſigned for ſeed.

Moſt chaff produced by wet harveſts.

§. 14. Farmer Biggs, and farmer Briſtow were ſaying, that all ſorts of corn yielded but few hulls this year (1702). (Note, it was a very dry ſummer and harveſt). I aſked them, what might be the reaſon of it; they ſaid, that wet harveſts made the hulls come off the wheat-ears much more than dry ones, and likewiſe the * oyls from the barley, but eſpecially the ſmall feathery hulls that are at the bottom of the barley-ears; and in ſuch years the ſtraw threſhes very brittle, and breaks into little pieces, which adds much to the heap of hulls: it is alſo poſſible the oyls may grow longer in wet ſummers.

* beards.

Of a ſtraw-houſe.

§. 15. Allow, if you can, an empty ſpace of barn-room in harveſt-time, to receive the litter, and foddering-ſtraw, that you threſh out before cattle may come to fodder; otherwiſe ſuch ſtraw will be ſpoiled by throwing it into your back-ſide.

REEKS.

Houſing ſummer-corn preferred to reeking.

§. 1. I AM upon experience an enemy to reeking corn abroad that you have barn-room for, except it be wheat: if you propoſe to threſh out your corn within the compaſs of a year, the damage it may take by mice in ſo ſhort a ſpace is inconſiderable, eſpecially if by harveſt-time you have got the dominion over the mice by ſtore of cats, which a gentleman delighting in huſbandry ought to value as much as many do their hounds: the damage ſuſtained by mice will, I ſay, be inconſiderable in compariſon of the charge of reeking corn abroad. The computation of which laſt will run thus, viz. ſuppoſing it to be an oat, or a barley-reek of thirty-two load, ſuch a reek cannot well be ſuppoſed to be finiſhed in leſs than two days; in loading and pitching to reek muſt be employed,—

Seven

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[c] Mr. Duhamel tells us, it is a cuſtom in that part of France he writes of—to half-threſh the ſheaves without untying them, when there is a great deal of weed among the wheat. By this means, ſays he, they get the ripeſt and beſt grain, and few ſeeds of weeds; for the weeds being ſhorter than the wheat, are generally at the bottom of the ſheaves. Pag. 188.

	l.	s.	d.
Seven men at harveſt-wages	1	8	0
Two teams of horſes, two days	0	14	0
Thatching	0	3	0
Two load of ſtraw	0	15	0
Elming	0	2	0
Stowing it in the barn afterwards ſeven men, a day	0	7	0
A team of horſes, a day	0	3	6
	3	12	6

Beſides damages by birds devouring the ſides, and in hard weather pulling off the thatch, accidents by wet, charges and waſte in taking in, and hindrance from taking it in, it may be a month by hazy weather, or by not being able to ſpare people to do it, whereby many inconveniencies may be ſuſtained, and the mice to be maintained are near the ſame.

Negligence of ſervants in not ſecuring reeks againſt wet weather.

§. 2. It is a common folly of the bailiff or other ſervants in huſbandry to act without apprehenſions of rain, when there is no appearance of it: if reeks are making in hay-time, or harveſt, tho' the maſter has provided ſtraw in abundance to ſecure them, yet, becauſe the day's-buſineſs begins early in a morning, the ſervant is loth to beſtow the time in carrying ſo much ſtraw to the reeks as would ſecure them in caſe of bad weather, and, becauſe the buſineſs of carting holds out late in an evening, the ſervants are loth to leave a half-made reek ſecure againſt all weather by pitching up ſtraw enough upon it.—It is the maſter's buſineſs therefore to conſider the temper of ſervants, and, if ſuch works may be termed works of ſupererogation, to gratify with good ale rather than let them be undone.

Barley-ſtraw not equal to wheat for thatching reeks.

§. 3. I laid abundance of barley-ſtraw on the ridge of a long vetch-reek, and brought it up ſharp; I believe when the reek was cut the ſtraw was three foot thick, and yet the wet had run through this covering, and done conſiderable damage to the vetches:—the reaſons of it were two; firſt, barley-ſtraw is more woolly and ſpungy than wheat-ſtraw, which is cloſe and hard; ſecondly, the reek ſweated and heated pretty much, and it is obſerved in ſuch caſe the covering of ſtraw is hollowed, and ſoftened, and the reek thereby the apter to drink in the wet.

Of making a wheat-reek.

§. 4. I made my wheat-reeks on ſtaffolds, and, when I came to thatch them, I made a queſtion whether the perpendicular-ſide to the weather ſhould not be thatched as well as the eaves;—my thatcher ſaid, it was needleſs;—I replied, that farmer Crapp had told me, though he had houſed wheat in a reek-houſe, yet for want of having the ſides boarded, the wind had blown the rain againſt the ſides of the reek, ſo that it had received great damage.—The thatcher replied, he knew of that very well;—for they had not minded to lay the ear-ends of the ſheaves uppermoſt and upon a riſe, all along as they made the reek, and to lay the ſtraw-ends of the ſheaves downwards; which if they had done, it had been impoſſible for the rain to have drove upwards to the ears; but on the contrary, in making the reek they laid the ſtraw-ends of the ſheaves higher than the ear-ends; conſequently the rain that was blowed into the ſtraw-ends muſt neceſſarily run downwards to the ears.

Harry Miles of Wiltſhire was ſaying, that people in our country have not the way of making a reek well; for, as they work it up, they ſhould ſtill keep the middle full, and then, when the reek ſinks, that will throw the ſinking of the reek to the outſide, and ſo make the outſide lie the cloſer;—whereas, if the middle be left hollow, the reek will fall-in in the middle, and the outſide will be hollow.

It is proper in topping a wheat-reek to uſe a load or more of ſmall ſheaves, according to the ſize of the reek, becauſe a reek cannot be ſo conveniently drawn-in and narrowed at top with great long ſheaves as with ſlender ſhort ones; therefore your huſbandman ought to take care to order ſuch to be provided, and out of the ſame ground from whence he makes his reek, in caſe he means to lay only the corn of a particular ground in the ſame reek.

Though a wheat-reek be well made, yet the bonds of the outer ſheaves will be apt to grow, if long unthatched.

Of making an oat and barley-reek.

§. 5. We were ſetting up an oat-reek deſigned to contain twenty load, but by the foundation of faggots I rather judged it fit to hold forty load;—but the work-men ſaid, the caſe was different between oats and barley; for barley-ſtraw, being rougher in it's oyls, would not ſlip and ſlide as oat-ſtraw would, it being ſleek and ſlippery; therefore barley might be over-laid the foundation on all ſides as much as you pleaſed, but an oat-reek, which way ſoever it inclined, would be apt to ſlip away and tumble down; therefore an oat-reek muſt not be widened beyond the foundation; eſpecially if the corn is carried in dry, as this was, and ſo the more likely to ſlip.

Of mice in a reek.

§. 6. Farmer Wey of the Iſle of Wight, obſerving ſparrow-holes under the eaves of a reek, ſaid, if the birds rooſted in thoſe holes o' nights, it was a certain ſign there were neither mice nor rats in the reek, for, if there were, they would by their ſqueaking and running about at night ſo diſquiet the birds, that they would not endure it: he had, he ſaid, heard many ancient huſbandmen make that obſervation.

Peas and wheat ſet damp in reeks in the hill-country.

§. 7. I took-in a load of great partridge-peas out of a reek that was well thatched, and had ſtood a year and an half: to my great ſurprize the peas were as ſoft as when the reek was made, but they were ſweet and ſound; I kept the reek for my horſes.—The reaſon of their ſoftneſs doubtleſs was the damp winter-air, and Crux-Eaſton miſts, which the ſtrong winds had forced into the very middle of the reek:—I made the ſame obſervation a little before of a wheat-reek I kept over the year, and threſhed the latter end of the ſecond winter.

Of a hay reek.

§. 8. A great matter depends on the well reeking of hay, for hay will often ſwag and pitch in the reek after making, and muſt then be filled out with thatch to make it ſhoot off the rain as well as the reſt of the reek.

Of the form of a reek, and it's heating.

§. 9. If a reek of hay be not well brought in, it will be apt to heat, and in that caſe a long reek is beſt, becauſe it may be made as long, and as narrow as you pleaſe, and therefore will not be ſo apt to heat;—but there is the moſt loſs in ſuch a reek, becauſe more of it, in proportion to what it contains, lies expoſed to the weather;—therefore, if hay be well dried, and well brought in, a round reek is the moſt profitable; nevertheleſs, if it be water-meadow-hay, let it ſeem never ſo dry, I hold a long reek to be beſt, for ſuch hay will, notwithſtanding it's dryneſs, be apt to heat.—That indeed might be prevented by keeping the middle of the reek hollow from the bottom to the top;—but, when that is done, all the ſides of that hollow will be finnowy, and a pretty deal of waſte will be made that way too.

Of ſecuring hay from heating.

§. 10. Farmer Biggs, as we were ſpeaking of the diverſe ways of ſecuring a reek of ill-got hay from heating, ſaid, after I had told him of other ways, that they had of late years (before anno 1700) found by experience, that to cut a ſide-hole through the middle of the reek, of about four foot, or four foot and an half diameter, and to ſecure it by under-propping it with wood, was the beſt way, and the ſame method was to be uſed to prevent corn from mow-burning, either in a barn, or in a reek.

I obſerved at farmer Pain's at Gauſuks in the Iſle of Wight, in a hay-reek cut into the middle ſome faggot-ends appear; I aſked him the meaning of it; he ſaid, it was an excellent way to preſerve and ſecure a hay-reek from heating, which was done in this manner;—within about a yard of the bottom of the reek they fixt the firſt faggot end-wiſe, and then filled up the hay round it, and then placed another, and ſo on till within two or three foot of the top, and then they covered it, ſo that no wet could fall down to hurt the reek, and let it ſweat for three weeks, during which time it would ſmoke like a chimney, and after that you might take out the uppermoſt faggot, and fill up the vacancy with hay, and then top-up the reek and thatch it for the winter.

Not to thatch a hay reek after rain till it is quite dry.

§. 11. Laſt ſummer (anno 1701) I made a hay-reek, and a hard rain came upon it before it was thatched; but the miſhap was, I thatched too ſoon after the rain was over, that is, before the outer-coat was well dry: in opening it for winter-ſpending I found, that as deep as the wet and the damp of it had ſtruck-in, ſo far the hay was finnowy, and dead, whereby I might loſe a load of hay; but in caſe I had not thatched it till the outſide had been fully dry, the hay had recovered it's old ſweetneſs, and ſuffered no damage.

Of heating.

§. 12. Being informed that a vetch-reek I had ſet up had heated, I went to obſerve it, and, thruſting my hand into it, all along the ſide againſt which the wind ſet I felt no heat, nor in that end that took the wind oblique, but at the farther end from the wind, eſpecially towards the farther corner of that end, it was conſiderably hot within ſix inches of the out-ſide; ſo that it is the wind that drives the heat to and fro in a reek, and cauſes the pitching and yielding of it to that ſide it drives the heat to, and that vetch-reek, the wind being changeable, did for a week after it was made accordingly pitch from ſide to ſide.

GRANARIES.

Of keeping wheat.

§. 1. [a] SOME, ſays Varro, have their granaries raiſed high above the ground, and ſome make them under ground, but in either ſort they take care to keep out air and moiſture, for if they get in, they will breed the weevil. Wheat ſo laid up has kept good for fifty years.

§. 2. Brown quotes authorities, that in Ægypt wheat laid up in the ears in granaries has laſted one hundred and twenty years, and ſays, more ſtrange it may ſeem, how after ſeven years the grains conſerved ſhould be fruitful for a new production; for Joſeph delivered ſeed to the Ægyptians to ſow their land for the eighth year; and Theophraſtus ſays, ſeed of a year old is the beſt for ſowing, that of two years old is not ſo good, but, when more than three years old, it is quite barren, but proper however for bread-corn.—Yet ſeeing corn may be made to laſt ſo long, the fructifying power well may be conceived to laſt in ſome good proportion, according to the reaſon and place of it's conſervation. Theophraſtus ſays in another place,—In a certain part of Cappadocia called Petræ wheat has preſerved it's fructifying power even to forty years, and has been good for ſowing[b].

§. 3. In

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[a] Aliqui ponunt triticum in granaria ſublimia, &c.—Aliqui ſub terris, &c.—Et curant ne humor aut aer tangere poſſit, quo enim ſpiritus non pervenit, ibi non oritur curculio; ſic conditum triticum manet vel annos quinquaginta, &c. Varro, fol. 47.

[b] Mr. Tull ſays, the moſt ſecure way he knows of preſerving wheat is by drying it, and relates a ſtory of a neighbour of his in Oxfordſhire, who acquired a large fortune by this practice. His method was to dry it on a hair-cloth, in a malt-kiln, with no other fuel than clean wheat-ſtraw; never ſuffering it to have any ſtronger heat than that of the ſun. The longeſt time he ever let it remain in this heat was twelve hours, and the ſhorteſt time about four hours; the damper the wheat was, and the longer intended to be kept, the more drying it required; but how to diſtinguiſh the degree of dampneſs, and the number of hours proper for it's continuance on the kiln, he ſaid, was an art impoſſible to be learnt by any other means than by practice. His ſpeculation, that put him on this project, was, that it was only the ſuperfluous moiſture of the grain that cauſed it's corruption, and made it liable to be eaten by the weevil. When dried, the bakers allowed it worked better than new wheat, and every grain would grow after it had been kept ſeven years.

As the method propoſed by Mr. Duhamel for the preſervation of corn, by ventilation and kiln-drying, not only appears reaſonable and practicable, but has, according to him, been confirmed by experiments, I have here given an extract from his book, as a hint to the reader, referring him, for farther ſatisfaction, to the original, where he will find draughts of the buildings and inſtruments made uſe of for this purpoſe.

Mr. DUHAMEL on the Preſervation of Corn.

Conſideration des grains 1753. Page 12.

After having expatiated on the neceſſity and uſe of preſerving corn in granaries, eſpecially in France, where they are frequently in danger of famine, he proceeds as follows.

To preſerve corn according to the common method requires immenſe granaries which muſt be very dry, and built very ſtrong, and, in thoſe who have the care of them, great aſſiduity, ſkill, and probity are requiſite; and we may conclude that the want of ſuch edifices, and the difficulty

Of a granary. §. 3. In diſcourſe with ſeveral notable farmers on country affairs, they ſeemed to agree, that a brick granary, except lined within-ſide with boards, would

of procuring proper perſons to have the care of them, is the reaſon that magazines are not ſo much multiplied as could be wiſhed.

I hope, ſays he, by the method I ſhall propoſe, to obviate all thoſe inconveniencies. By theſe means a large quantity of corn will be preſerved in a ſmall compaſs, without danger of heating or fermenting; it will be ſecured from the depredations of animals and inſects; and you need not fear even the incapacity or infidelity of thoſe that are employed to take care of it; and all this without trouble and at a very ſmall expence. But before I propoſe my method, I ſhall deſcribe the common practice of the provinces about Paris. The inconveniencies will be eaſily perceived, and you will be better enabled to judge of the great advantages ariſing from the method I propoſe.

Page 14. When corn is laid up in a granary with intent to be kept a great while, the cuſtom is to ſpread it only eighteen inches thick; 'tis true that, when it is old and very dry, the granary perfectly free from moiſture, and the joiſts ſtrong enough to ſupport the weight, they may lay it ſomewhat thicker; but, as we muſt fix on ſome determinate height, I choſe this as the moſt common in large granaries. That the corn may not lie againſt the wall, they generally have a paſſage of about two foot all round. By this means they prevent the corn from being loſt by running down the chinks that neceſſarily happen at the edges of the floor; they remove it from the holes made by rats and mice; they take care to prevent the dirt, which falls chiefly from ſuch places, from mixing with the corn; they remove it from all moiſture that may come from the ſweating of the walls, or from any defect in the roof: laſtly, the grain is more expoſed to the air, and they contrive to leave a paſſage for it's reception. This is a cuſtom generally obſerved, and probably has been found neceſſary.

Page 15. The corn being thus removed from the walls, the ſides of the heap make a declivity, which as far as it reaches, contains but half as much as if the ſides of the heap were perpendicular, and this makes a loſs of near a foot all round the granary; laſtly, they leave a ſpace, at one end, ſufficient for turning the corn; all this greatly reduces the contents of the granary, and, to make it more clear, I ſhall give an example.

Suppoſe a granary eighty foot long and twenty-one broad, which makes one thouſand ſix hundred and eighty foot ſuperficies: you muſt take off for the paſſage and the ſlopeing of the corn, at leaſt three foot on each ſide, which makes ſix foot for the whole length, or four hundred and eighty ſquare feet, which being taken from one thouſand ſix hundred and eighty there remains but one thouſand two hundred, from which you muſt take at leaſt fifty foot for the ſpace neceſſary for turning the corn and the paſſage at the other end: ſo that you can reckon only on one thouſand one hundred and fifty foot ſquare of room, which at eighteen inches deep will contain one thouſand ſeven hundred and twenty-five cubic feet of corn, which will weigh about ninety-two thouſand pound.

Page 17. It appears from the foregoing example what immenſe buildings are neceſſary for a large magazine, and the vaſt expence that muſt attend the building and maintaining them. The buildings at Lyons called les greniers de l'abondance, of which we ſhall ſpeak hereafter, will furniſh a further proof of it.

It follows then that it will be of great advantage to lay up a great quantity of corn in a ſmaller compaſs, and we ſhall make it appear in the following diſcourſe that it may very eaſily be done.

Corn, tho' dry to appearance, contains a great deal of moiſture. I have put new corn in glaſs bottles well ſtopped: the moiſture that came out of it appeared on the inſide of the bottle, and the grain grew moldy. At certain intervals, in the year 1745, I weighed a quantity of wheat of the laſt harveſt, I expoſed it for twelve hours to the heat of a ſtove or kiln, which raiſed Mr. Reaumur's thermometer to fifty degrees: it loſt an eighth of it's weight, and yet was only dried; for being ſowed it came up.

Page 18. In 1744 I put ſome wheat, and other grain, of the harveſt of 1742, into a ſtove heated ſo as to raiſe Reaumur's thermometer to 38° which is 8° higher than our hotteſt ſummers; both the ſorts of corn, that were uſed for the experiment, in twenty-four hours were found to be diminiſhed $\frac{1}{32}$; they were put again into the ſtove, which was heated to 51°, and in twenty-four hours after were diminiſhed nearly $\frac{1}{10}$; beſides that which was weighed, there were ſome ſeparate parwould damp and moldy the corn that lay next the ſides, eſpecially on the weather-ſide, which they called the ſouth-weſt ſide;—they gave inſtances of ſome

cels both of new and old corn ſet apart, to try what degree of heat it would bear without deſtroying it's vegetation. I ſowed ſome that had ſuffered 12½°, ſome 38, and ſome 51: and in all theſe caſes, the new came up, but the old did not.

It is remarkable that, be it never ſo hot during harveſt, the ſheafs that lie at top of the heap are harder to threſh than thoſe that lie at bottom, which is the conſequence of moiſt vapours that riſe from the corn.

Page 20. If you put a large heap of corn in a granary, and do not ſtir it for a conſiderable time, or if you only fill a barrel, after ſome time, upon running your hand into it, you will find a ſenſible heat in it and a ſmall moiſture; ſome time after it acquires a vinous ſmell, then turns ſour, and at laſt moldy; in a word it ferments, and is no longer fit to make bread, and ſometimes even the fowls will not eat it.

It is to prevent fermentation that they lay it ſo thin, as eighteen inches, in the granaries, and turn it ſo often.

If it has been a wet ſeaſon, and much rain fallen during harveſt, they are obliged to turn the corn every three or four days; but when corn is well conditioned, and the firſt year is paſſed, it may be ſufficient to turn it once a month; ſome turn but once a fortnight in the months of May, June, July, and Auguſt.

Theſe are the expences, and the care that attends it is not inconſiderable, eſpecially in ſummer, when the farmer has ſo many calls and occupations in the field; nevertheleſs the proprietor muſt keep a ſtrict eye upon his workmen; for, beſides the frauds they will commit, eſpecially when corn is dear, they frequently ſtir only the top of the heap, ſo that the bulk of the corn which you think has been turned was never ſtirred at all.

Page 22. Whoever can ſave theſe expences and cares, will render the preſervation of grain much more eaſy; and that is what we hope to ſhew in the following work.

Wheat is not only the nouriſhment of men, but many other animals are particularly fond of it. Nobody can be ignorant of the great waſte that is made in granaries by rats, mice, and birds: it ſeems poſſible to defend it from theſe depredations by carefully ſtopping all paſſages, laying ſnares, poiſon, &c. but all theſe precautions will not ſuffice to prevent the pillage of theſe animals, who, beſides what they eat, waſte a great deal by means of the holes they make, through which the corn runs down, and it is loſt. If the farmer makes holes for cats to go in at, the birds will take the advantage of them, and the cats themſelves contribute to the waſte by their excrements, which form heaps of infected corn.

Our labour, therefore, will not be loſt, if we can arrive at a method by which we may have nothing to fear from theſe animals, and that without the uſe of cats, ſnares, poiſon, &c.

One of the greateſt obſtacles to the keeping of wheat, is the inſects that breed in it: the chief are the weevil and moth. How often have the naturaliſt, the philoſopher, the lovers of the publick good, endeavoured to ſearch out means of exterminating theſe inſects, which increaſe ſometimes to ſuch a number as to devour a great part of the grain? All the methods that have been propoſed have either proved ineffectual, or impracticable; the only one uſed in our province is the paſſing all the corn over a wire ſkreen; part of the weevils, and the corn they have damaged, falls through into a copper veſſel, which they ſet under the ſcreen; but this tedious and expenſive operation, only diminiſhes the evil without curing it; inſtead of which we hope to propoſe a method, by means of which you will have nothing to fear from any ſort of inſects, and that without charge or trouble.

Page 25. The buſineſs is, in order to render the preſervation of corn eaſy, firſt, to keep a great quantity in a ſmall compaſs; ſecondly, to prevent it's fermenting, heating, or contracting any ill taſte; thirdly, to guard againſt the rapine of rats, mice and birds, without expoſing it to the damage occaſioned by cats; fourthly, to preſerve it from mites, moths, weevils, or any other inſect, and all this without charge or trouble. Let us ſee if all this may be brought about, and give an account of the experiments we have made on the ſubject.

We cauſed a caſe or little granary to be made, of oak plank two inches thick, forming a cube of five foot every way; at ſix inches from the bottom we made a flooring, or ſecond bottom of lattice work, placed upon joiſts of five inches thick; covering it with a ſtrong canvas; and this little granary ſome farmers who had ſuffered by it ;—and a carpenter being there did atteſt it.—They ſaid that mice would neither meddle with barley nor peas, if they could

nary was filled quite full of good wheat; it contained ninety-four cubic feet, weighing five thouſand and forty pounds.

Before we proceed any farther, it is proper to obſerve, that ſuch a granary of twelve foot cube will contain one thouſand ſeven hundred and twenty-eight cubic feet of corn, whereas the granary we inſtanced in the beginning of this work, which had one thouſand ſix hundred and eight ſquare feet of ſuperficies, could contain, in the common method, no more than one thouſand ſeven hundred and twenty-five cubic feet of corn.

Page 27. This is an immenſe ſaving both of room and expence, ſince for about ſixty pounds you may build ſuch a granary of brick or ſtone fifteen foot ſquare and twelve foot deep, which will contain two thouſand ſeven hundred cubic feet of corn; whereas a granary, in the common form, to contain that quantity, would coſt eight or nine hundred pounds.

The little granary being filled quite full of corn, is to be covered with good oak planks, ſo cloſely joined, that neither rats, mice, or even the ſmalleſt inſect can get in, leaving only ſome vent-holes, with trap-doors, or covers fitted very exactly to them, of which we ſhall ſpeak hereafter.

Thus is our corn depoſited in a ſmall compaſs, and perfectly ſecured from rats, mice, birds, and even inſects, provided there were none before in the granary, or among the corn; but, if there ſhould, we ſhall hereafter preſcribe a method of deſtroying them.

Page 29. It is notorious in this climate, that corn laid up in great heaps will ſoon ferment and ſpoil, to prevent which it is neceſſary to force out the tainted air, and ſupply it's place, from time to time, with freſh, in ſhort to eſtabliſh a current of air, which ſhall paſs through the corn, and carry off the dampneſs. For this purpoſe we propoſed to make a falſe bottom of lattice work covered with coarſe canvas (but if it were for a large granary, wire in the manner of a ſieve might be better) through which the air might paſs, and be forced out at the vent-holes at top.

Page 31. This purpoſe is anſwered by bellows, and the moſt proper for the purpoſe are thoſe contrived by doctor Hales (as deſcribed in his book called a Deſcription of Ventilators) being conſtructed without leather, or any other matter that is liable to be deſtroyed by vermin.

Page 35. A large pair of theſe bellows being ſo fixed as to receive the air from without, and convey it between the bottom and falſe bottom of the granary, when you would ventilate the corn, open the vent-holes at top, and work the bellows, which will drive the air through the whole body of the corn with ſuch force as to make the duſt fly out of the vent-holes, and when confined to one ſmall opening will blow up ſome grains of corn a foot high.

Page 36. Every ſtroke of the bellows conveys two foot cube of air into the granary, which, at the rate of four hundred and twenty ſtrokes in five minutes, will ſupply eighty thouſand ſix hundred and forty cubic feet in a day, that is to ſay in eight hours working.

The proportion of air in a heap of corn is found by calculation to be about $\frac{1}{11}$, but ſuppoſing it even a third part, it will be changed two thouſand ſix hundred times in a day, with one pair of bellows; but my granary has two pair.

Page 39. The corn I choſe for this experiment was of good quality: I ventilated it, not more than ſix days in a year, without the help of fire, which was ſufficent to keep it ſo well that the beſt judges allowed it to be as good as could be.

When the bellows had not been worked for ſeveral months, the corn was allowed, by good judges, to look and ſmell perfectly well, but they objected that it did not handle well, that is, that it had ſome little dampneſs in it. The bellows were worked for half a day, and that objection was entirely removed.

Page 49. In hot countries corn may be preſerved for a long time by being depoſited in a vault or ciſtern, ſo cloſely ſtopped that the air can have no acceſs; but experience ſhews, that this method will not ſucceed in our climate, the ſun not having power to exhale moiſture from the corn ſufficient to prevent it's fermenting, when laid in a large heap; and this is further proved by ſeveral experiments of corn dried in a kiln, which, tho' it's weight was very conſiderably diminiſhed, did not loſe the vegetative quality, but grew very well.

Page 51. It follows from theſe obſervations that it is neceſſary to take away the ſuperfluous moiſture, and reduce our corn to the ſame degree of dryneſs as that of the hotteſt countries, in order to preſerve it in great bodies.

Experiment

could get any thing elſe.—They ſaid, it had been commonly aſſerted that mice would not touch wheat, where they could have oats; that many therefore

EXPERIMENT on ninety-four cubic feet of wheat (not dried) which was preſerved by ventilation only, above ſix years. Page 55.

In the month of May, 1743, ninety-four foot of wheat was put in one of the little granaries beforementioned; it was of the harveſt 1742 and of an excellent quality, perfectly clean, and ſo dry, that it loſt only $\frac{1}{16}$ of it's weight by a ſmall quantity of it for a trial being dried on a kiln with the heat at fifty degrees of Reaumur's thermometer. This wheat was well cleaned from duſt, and depoſited in the granary without being dried by fire.

The firſt three months it was ventilated for eight hours once a fortnight, the reſt of the year 1743 and all 1744 it was ventilated once a month, all the year 1745 and part of 1746 but half a day once a month, and after that but once in two or three months.

In the month of June 1750 the granary was emptied, and the wheat found to look and ſmell very well, but felt a little rough in the hand, becauſe not having been moved for ſix years, the little hairs that are at the extremity of the grains, and the particles of the bran were roughed up; but after paſſing twice through the wind-ſcreen that objection was entirely removed, and it was found by the bakers, paſtry-cooks, &c. to be perfectly good.

This was corn of eight years old, ſeven of which it was preſerved in the granary without any ſenſible diminution, and without any damage from rats or other animals; it cannot be ſaid without expence, becauſe there was a man employed from time to time in the ventilating, but it is very eaſy to reduce that expence almoſt to nothing, as will be ſhewn hereafter.

EXPERIMENT on ſeventy-five foot of new wheat extreamly moiſt, grown, and that had already contracted a bad ſmell. Page 62.

The harveſt 1745 was very rainy, and all the corn grown in the ear; in the common granaries it was always in a ſtate of fermentation, tho' laid but a foot deep, and turned every four or five days.

Seventy-five foot of this grown corn, which ſmelled very ill, and was ſo moiſt as to wet the floor of the granary where it lay a few days, was put, in this condition, and without being dried, into one of our little granaries with ſmall hopes of ſucceſs.

As the corn was very hot when put into the granary it was ventilated three or four times the firſt week, once in eight days during December and January, and, as it had then loſt great part of it's bad ſmell, from that time till June once a fortnight.

Then perceiving, by running one's hand into the top of the heap, that it heated, we concluded it was going to be intirely corrupted, which determined us to empty the granary; but, when we had taken out about a foot of the top, we were greatly ſurprized to find the reſt freſh, having very little bad ſmell, and drier than that preſerved in the common granaries. So that we regretted having emptied it.

The reaſon why the top was the worſt was, the moiſt vapours being always forced upwards in ventilation; and we apprehend, if inſtead of emptying the granary it had been ventilated oftener, the moiſture that was at top might have been dried away.

This experiment teaches us one thing of importance, which is, that in this ſort of granary the top of the heap is moſt ſubject to heat, ſo that if the grain taken out of the vent-holes is in good condition, you may conclude the reſt to be ſtill better.

EXPERIMENT on five hundred and fifty-five foot of wheat of the year 1750 (which was very damp and difficult to preſerve) put into one of our granaries without being dried on a kiln. Page 69.

It muſt be allowed that in this method it is very material to clean the corn well before it is put in the granary, becauſe it is impoſſible to do any thing more to it till it is taken out for ſale, but above all you muſt be careful to clear it from ſmut or blighted grains; for we find, by experience, that they will communicate a bad ſmell to the whole.

This five hundred and fifty-five feet of wheat was ſo well cleaned, that, tho' at firſt it had $\frac{1}{6}$ part of ſmut or blighted grains, there remained ſcarce any appearance of either when it was put into the granary, fore would lay oats in one half of one ſide of their barn, and wheat in the other half of the ſame ſide, but they themſelves never found but that the mice would eat heartily of both.

THATCHING.

granary, only a light duſt that it was impoſſible to get rid of, on account of the moiſture of the grain, which made it adhere too faſt to be removed by ſcreening.

This wheat ſo well cleaned was put in one of our granaries, which had the bellows moved by a wind-mill.

There was no want of wind during the years 1751 and 1752, and, as it required neither expence nor trouble, it was often ventilated, which preſerved it very well, and not only dried it, but alſo cleaned it, in a great meaſure, of the bad ſmell it had when it was put in.

When it was taken out it was very full of a fine duſt, which ſeparated from the grain in proportion as it dried, but, after having paſt the wind-ſcreen, it was found to be very good, and was bought by the bakers at the top price of the market.

Page 72. By this experiment it appears, that very moiſt corn, which has a great diſpoſition to ferment, may be preſerved in theſe granaries by ventilation only; but he thinks it not ſafe to truſt to this ſole precaution; becauſe, if a calm ſhould happen about the month of June, ſo as to rob us of the uſe of our ventilating-mill, at a time when all nature is diſpoſed for fermentation, the whole might be ſpoiled.

To prevent which, he propoſes two methods.

Page 72. The FIRST METHOD

Is to keep corn near a twelvemonth in a common granary, during which time you will have opportunity to uſe all means of cleaning it, by which operations it will loſe ſo much of it's moiſture, as to be perfectly fit for the granary of preſervation.

This method will anſwer for ſuch as deſire to preſerve the produce of their own lands only, and are already provided with a common granary: but thoſe that would buy up a large quantity of corn, when the price is very low, for the chance of ſelling at a better market, muſt follow the

Page 75. SECOND METHOD.

You muſt have a common granary ſufficient for cleaning the corn before you put it in the granary of preſervation; but as ſoon as it is well cleaned you muſt dry it in a kiln (which is hereafter deſcribed) for by this operation, which is neither troubleſome nor expenſive, you will in a very little time dry it, more than if it had lain in a common granary for a year. After which operation you may put it in the granary of preſervation without any fear, having only once paſſed it through the wind-ſcreen to cool it, and clean it from duſt; as will appear by the following experiments.

Page 76. Experiment on ninety foot cube of fine wheat, which was preſerved without ventilation, after having been dried in a kiln.

This wheat, tho' very full of ſmut and duſt, was ſo well cleaned as to have no fault remaining but dampneſs; it was dried in a kiln, by which it loſt a little diſagreeable ſmell which it had before; when it was thought to be ſufficiently dried, it was depoſited in one of our granaries of preſervation, which had bellows adapted to it, but there was no occaſion to make uſe of them.

It appears by the foregoing experiment, that wheat well cleaned and dried need not be ventilated.

Page 78. Experiment on ſeventy-five foot cube of ſmall wheat, mixed with ſmut, which had been dried in a kiln.

Our different ſcreens cleaned the large wheat perfectly, but with all our care we could not free this ſmall wheat from ſmut, duſt, &c. of which much remained, and the kiln did not clear it from the bad ſmell it had contracted.

Frequent ventilation would undoubtedly have taken away that bad ſmell, but this experiment being to try the effect of the kiln only, we determined not to ventilate, unleſs there was great danger

THATCHING.

Of reeking ſtraw.

§. 1. I Was telling a Dorſetſhire farmer how uſeful it was to have wheat-ſtraw ſaved againſt an unforeſeen occaſion, and for which it was often wanted.—He allowed, it was very good huſbandry, and added that he commonly uſed to reek his wheat-ſtraw, which would take no damage for a year or two; and, if there was no occaſion for it, it would make litter and dung at laſt; therefore, as wheat-ſtraw in ſome years proves very ſhort, or blighted, in neither of which caſes it will be fit for thatching, ſo it is prudent to ſave and reek what one can ſpare, when it proves long and good.

Oat-ſtraw of no great uſe.

§. 2. It is of great uſe to have a good reſerve of barley-ſtraw, or wheat-ſtraw, to fling ſome loads of either on the peas, and barley-reeks, to ſecure them when they are obliged to lie a long time unthatched; as for oat-ſtraw, it is of no great uſe, unleſs to cover an oat-reek, or peas for fatting hogs, or corn for fowls.

Of helming for thatching.

§. 3. When ſtraw is heaped up together in order to be helmed, it is fit at the time of wetting ſtraw for helming that there ſhould be two perſons to keep the

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danger of it's corrupting, which did not happen; but yet the bad ſmell increaſed ſo much that we were obliged to kiln-dry it again after it was taken out of the granary, and to ſcreen it ſeveral times, by which means it made tolerable good bread.

This experiment ſhews, firſt, how neceſſary it is to clean the corn well before you put it in the granary of preſervation, and that, in ſome caſes, both ventilation and kiln-drying are neceſſary; ſecondly, that corn, which has contracted a bad ſmell, may be cleared of it by the kiln and wind-ſcreen.

Having found by the foregoing experiments that good corn, well cleaned, and properly kiln-dried, may be preſerved without ventilation, and that good corn tolerably dry may be preſerved by ventilation only, we conclude it muſt be moſt advantageous to join both methods, eſpecially for large magazines. Page 80.

EXPERIMENT on eight hundred twenty-five foot cube of fine wheat lightly kiln-dried and ventilated. Page 80.

This wheat was of the year 1750, and conſequently but of a middling quality; after being well cleaned, and lightly kiln-dried, it was put in the granary of preſervation about ſeven foot deep, which granary had bellows worked by a wind-mill.

This corn had a bad ſmell, which was not entirely diſſipated by the kiln, but was entirely cleared of it by ventilation; it was not only well preſerved, but ſo meliorated, and became of ſo good a quality, that the bakers preferred it to all other, and bought it two-pence per ſack dearer than the ſame wheat preſerved in the common method.

It is certainly moſt advantageous to unite both methods, not only becauſe it is the moſt effectual in preſerving the corn, but it is alſo the leaſt trouble and expence: for to kiln-dry it ſufficiently to keep without ventilation requires a large fire and long attendance, and to preſerve it without kiln-drying will require very frequent ventilation, whereas by joining the two methods you render both very eaſy, leſs expenſive, and the ſucceſs more certain. Page 82.

In all theſe experiments we have never ſuffered any thing by moth, or weevil, tho' the common granaries were greatly infeſted with them at the ſame time; this is a good prognoſtic, but we muſt not conclude from hence that this method will abſolutely prevent the miſchief: it may be ſuppoſed, that the care we had taken, in theſe experiments, to clean the corn, had entirely freed it from them, and may be objected that this great care cannot be taken in large proviſions, and the heap cloſe together by beating it, whilſt one flings water on it; otherwiſe, if the ſtraw lies hollow, the water will run ſo faſt through it that it will not take wet.

Of binding on the thatch.

§. 4. It is found by experience, that in thatching barns, &c. it is more profitable to bind on the thatch with pitched ſhip-cordage untwiſted (which is ſold at market-towns) than to bind it on with withs, not only becauſe the cords bind faſter, which is much to be regarded in places expoſed to the wind, but becauſe they alſo endure longer: this method likewiſe ſaves the time of twiſting the withs, as well as prevents the damage done to the young coppices in cutting them, and often unſeaſonably too: if you pleaſe, the ſame perſon who thatches may alſo bind on the cords, which ſaves one labourer's hire, but it is thought to be better that a labourer ſhould be within-ſide to bind, becauſe he can do it ſtronger, which is of great conſequence.

Of helming long before thatching.

§. 5. I told Mr. Hillman near Andover that the mice got into my wheat-ſtaffold, tho' it was impoſſible for them to come up by the ſtaffold.—He aſked me whether I did not make up the helm ſome time before I thatched with it, for, if I did, the mice might very likely be carried into the reek.

Of wetting the helm to top reeks.

§. 6. It is very good huſbandry to top hay or corn-reeks with well wetted helms, that they may be well ſparred down, and the ſparrs will then ſtick well

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and that, ſhould any get into the heap, they would be more dangerous, inaſmuch as they would not be diſturbed for ſo long a time; theſe reflections determined us to make the following experiment.

Of the MOTH or WORM.

Page 84. The moth lays it's eggs on the corn, the eggs produce a worm or caterpillar, which feeds on the corn, and ſpins a ſilky web all over the ſurface, ſo as to make a cruſt ſometimes of three or four inches thick, which is entirely ſpoiled, beſide the bad ſmell it communicates to the whole.

Page 87. In winter 1746 we collected all the wormy cruſt (from our ordinary granaries) which was very thick, the moths having been very numerous the preceding ſummer: theſe cruſts were broke, and ſcreened, and what grain could be got from it (which undoubtedly was impregnated with the eggs of the moth) was put in one of our granaries which contained ſeventy-five foot cube, and ventilated from time to time all winter.

About the end of May if you opened the vent-holes at top, a vaſt number of moths flew out, which ſhewed they did not like their ſituation.

In the month of June 1747, the granary was emptied; the moths and worms were all periſhed, and there was found only a thin cruſt on the top, of about $\frac{1}{8}$ of a inch thick, and the corn had loſt part of the bad ſmell it had when put into the granary, inſomuch that it ſold for the current market price.

Of the WEEVIL.

Page 89. The weevil is of the beetle kind, it devours a great quantity of corn, old as well as new, but does not communicate any bad ſmell to it, as the moth does; it will endure the heat neceſſary for kiln-drying, and is numbed but not deſtroyed by intenſe cold: they are generally found collected in heaps, which feel very warm, which warmth probably is neceſſary for hatching their eggs, and if ſo, they will not be in a condition to propagate their ſpecies in our granaries. No ſmoke will deſtroy them but that of ſulphur, and that gives a bad ſmell to the corn.

Page 95. In the month of May 1751, we put ſome weevils into our granaries, and when it was emptied in Auguſt 1752, we found none.

well in them; whereas, if you top with dry ſtraw, the top will be liable to be blown off, becauſe it lies looſe and hollow, nor will the ſparrs ſtick faſt in dry ſtraw.

Of thatching with oat-ſtraw.

§. 7. I was thatching my cart-houſe with oat-ſtraw; it was March the 14th (anno 1703)—my oats not having lain long enough in ſwarth did not threſh clean: the thatcher told me, he feared abundance of them would grow in the thatch, and would damage it by rotting after they had grown, and ſtop the rain from running off, eſpecially if a wet ſeaſon, which would make the oats grow, ſhould enſue, but, if it ſhould prove a dry ſpring, they might be malted; ſaid he, had this ſtraw been laid on in winter, the cold would have killed the oats in chitting, and ſo the damage had been prevented.

MALT and MALTING.

Barley as ſoon as houſed will malt well.

§. 1. FARMER Sartain and others ſkilled in malting do allow, that barley, as ſoon as it is houſed will work very well, and make very good malt, provided it took no wet in the field, after it was cut, but if it did, they ſay, it will not work well.

Barley very dry when houſed will not malt well.

§. 2. Mr. Slocock of Newbury, a maltſter of long experience, informs me (it having been a dry ſeaſon for a good while) that the forward barley, which was already cut, and carried into the barn, was dried up with the drought, and would not therefore make ſo good malt as that which ſhould be houſed after rain: it is true, ſaid he, ſuch dry barley will raiſe an increaſe and ſmell well, and will put forth a beard, i. e. a root, but it will not put forth a ſpear to run half the length of the barley-corn, and ſo cannot make good malt, becauſe the hardneſs of the rind binds up the ſpear from ſhooting.—So, it ſeems, a rain on dry ſhrunk-barley not only thins the rind, but looſens it alſo from the flour, that the ſpear may the better ſhoot up between. Mixt barley, that is, ſuch, of which ſome was brought in drier than the other, will never make good malt; it will not come all together; it is the ſame with old and new corn.

When ſweating in the mow it will not malt.

§. 3. Barley, when firſt cut, before it has ſweated in the mow, will come as well as afterwards, but whilſt it is in it's ſweating it will not come at all.

Of the malt-kiln and of changing the water.

§. 4. Diſcourſing with Sampſon Creſs of Holt in Wiltſhire, an obſerving maltſter, about the art of making malt, I told him among other things, that I found the lighter the kiln was loaded in drying off a kiln of malt the ſweeter the malt would be; for ſhould the kiln be loaded ſome ſix inches deep, neither the flame nor the ſmoke would paſs off well, but the malt would be ſuffocated with ſmoke.—He replied, that he believed, if my kiln was choaked with ſuch a thickneſs, it could not have a good draught, but muſt be a faulty kiln; for, ſaid he, a good kiln ought to have ſuch a draught as to roar like wires on a river, or like a furnace under a brewing copper.—Again,--I told him the opinion of ſeveral judicious maltſters about changing the water in the ciſtern while the barley is wetting, eſpecially if it be coarſe or cold, becauſe a ſlimy water would run from it.—He agreed, that in the fore-end of the year, before the barley had taken it's due ſweating, be the barley never ſo good, it muſt be very proper, becauſe the water ſuch barley is ſteeped in will be foul, and the giving it a ſecond wetting or running of water muſt needs cleanſe it, and tend to the making ſweet malt.—In the ſame manner, ſaid he, it is likewiſe proper to do by barley wetted at the latter end of the year, towards ſpring, becauſe, when the weather grows warm, water ſoaking barley forty-eight hours will grow ſour, and begin to corrupt.—The next day I talked with William Sartain of Broughton, and Mr. Whatly of Bradford, Wilts, who are both of them maltſters; they admitted it to be advantageous for the corn in the ciſtern to change the water at any time, except in the middle of winter, when the weather was too cold.—As to the quick draught of the kiln, and it's roaring (as above hinted) that, they ſaid, in many malt-houſes depended on the corner the wind ſat in, and on the opening of doors or windows; that though ſuch fierce fires were beſt for high-dried malt, yet a gentler fire was beſt for the pale-dried malt.

Of drying the malt on the floor.

§. 5. The two maltſters mentioned in the laſt obſervation agreed, that you cannot keep barley too backward on the floor, nor give it too much time, in caſe it neither harles at root nor ſpear, and that, receiving it's drying on the floor, it would require the leſs fire and wood.

Hill-country barley preferable to the vale for malt.

§. 6. The hill-country barley has a much finer coat, and conſequently more flour than the barley of the vale: the hill-country barley will be watered or wetted in four tides, whereas the vale barley requires five, and the hill barley, when it is watered, will in it's coat look as clear as the horn of a lanthorn.—Note, every day is a tide, and every night is a tide.

Of changing the water, and of the choice of it.

§. 7. On obſerving that the ſtraw-dried malt I made at Crux-Eaſton wanted the fine elegant flavour that was common to ſuch malt made at Holt, &c.—I diſcourſed Sampſon Creſs about it,—and he ſuſpected two errors in my method of wetting; firſt, that the water I both wetted my barley and brewed my malt with was not agreeable, for, if that was wanting in either caſe, though I might brew very ſound drink, yet it would want that fine flavour I complained to be deficient: though, ſaid he, I have a well, yet I fetch my water both for wetting my barley, and brewing my malt from Staverton-river; for pond, or well-water, that is either foul or unpleaſant taſted, will want the ſpirit when made drink of, and he wiſhed me to uſe chalky water out of my well for both uſes, for that is the water, ſaid he, I would uſe if I had it.—Secondly, it is poſſible you do not change your water often enough at wetting; for it is common for the firſt water to come away ſlimy, like ox-drivel, as you may find by taking up ſome of the barley out of the ciſtern, and the water will taint and grow ſour, if not changed during the five tides; which will give an odd taſte to the malt, or at leaſt rob it of it's flavour; you ſhould at leaſt change the water once, eſpecially in the two warm ſeaſons of making malt, viz. in the ſpring, and at autumn, for then the weather is warmer than in winter, and will ſooner taint; but if you ſhould change the water three times in warm weather, you will find it the better, and you will do well to have a hogſhead of water ready to run into the ciſtern as ſoon as the former water is let out, becauſe the barley by lying cloſe may be apt to heat.—He ſaid, he finds with him a hogſhead of water will wet a quarter of malt.

In the ſpring, and at autumn, when the weather is warm, he thinks four tides enough, becauſe the water being then warmer than in winter, four tides will penetrate more than five tides in winter.

He ſaid, in caſe barley would not work well, becauſe it was coarſe and cold, he gave it ſix tides, and changed the water after the third tide; otherwiſe it would be ſlimy before it could be flung on the floor, nor would it without ſo many tides take water enough to come * ſuant;—therefore, it is a great error in my maltſter in ſuch caſe to give barley only four tides, as I have found he does.

* kindly, well.

Of the quantity to be wetted in proportion to your floor.

§. 8. I propoſed to my maltſter, to wet but three quarters of barley at a time, that it might have longer time on the floor, leſt, by wetting more, which would require more room, one heap ſhould preſs too faſt on the other;—but he was againſt it, and ſaid, it was beſt to wet as much as the floor would carry, which was four quarters at a wetting; for, ſaid he, the more outſides you make the worſe the barley will work; [as it ſtands to reaſon it ſhould] for the outſides which lie to the air, never work ſo well as the inſide, and the more heaps you divide your quantity of barley into the more outſides you make.

Not to heap up the malt, that it may heat before drying.

§. 9. I aſked William Sartain, whether he approved of the cuſtom of flinging up the malt from the floor into an heap before the kiln, and letting it heat before they dry it; he ſaid, by no means; but, ſaid he, it is an old way, and they did it becauſe it's being heated by ſo doing would forward it in the drying, and ſave fuel, but it makes it high coloured. Whatly ſays, it will both give it a higher colour, and make it bite freer, i. e. ſhorter, but he does not, he ſays, uſe it. Sampſon Creſs ſays the ſame, but condemns the practice. It was an old way among maltſters, but they have found it to be wrong. Whatly ſays,—ſome uſed to let it take heat till one might almoſt roaſt an egg in it, but ſurely, ſays he, that muſt make the drink apt to turn ſour.

Of turning the malt often at ſpring and autumn.

§. 10. In the ſpring, and at autumn, the barley will be apt to come rugged, i. e. put forth a ſingle root at a time, inſtead of puſhing forth all it's roots, in a manner at once: this is a fault;—in ſuch caſe the forwardeſt root will be apt to draw all the ſubſtance of the flour away, and rob the reſt, and prevent them from ſhooting forth, and ſo you can never have good malt.—To prevent this inconveniency, you muſt turn the heap often, and give it air, and ſpread it thinner, in order to keep it cool; which will check the tap-root from running out ſo haſtily, and give the other roots time to come on; without which you cannot make good malt.

Rules for managing malt in order for brewing.

§. 11. If you are deſirous of having your drink in the greateſt perfection, I would recommend it to you to have regard to the following obſervations;—

Firſt, to take great care that your malt be well ſcreened, that being never thoroughly done by the maltſter; and therefore ought to be done over again by you; for if you keep it, not being exceeding clean from duſt, and all manner of foulneſs, it will in a little time decay and corrupt, and will give an ill taſte to your drink, nor will that fine well, but be muddy.—Secondly, to let your malt ſettle five or ſix days in the ſack after you have ground it; for it will then much better fall to flour, and grow dry, whereas otherwiſe it will be clammy, and the water will not dilute it[a].--Thirdly, the older your malt (but exceeding twelve months at leaſt) the better; the time therefore for buying of malt is before any new barley can be threſhed out; for after new barley comes to market the maltſter will be mixing the new malt with the old, but old malt will go much farther than new.—Fourthly and laſtly, let your malt be well dried; for ſlack-dried malt will not keep; for keeping it ought to be well dried.

Cloſe preſſing the malt a prejudice to it.

§. 12. October the 4th (anno 1712) Mr. Hillman, maltſter, of Andover viſiting me, we diſcourſed about making malt: Mr. Hillman ſaid, the act of parliament that laid the duty on malt was a general prejudice to it's being well made; for before the act the maltſters uſed to fling the barley out of the ciſtern or ſtone into the floor, and then caſt it forward again, that the ſour water might run off, and then fling it back into an heap, or a couch of only ten or twelve inches thick, that it might lie eaſy;—but now the maltſters, out of lucre of having the couch meaſure the leſs, thereby to leſſen the duty, fling the corn out of the ciſtern as wet as poſſibly they can, that the weight of it may preſs it the cloſer together, and to that end they lay it in a heap or a couch of twenty-four inches high, without flinging it off for the water to drain away, whereby the undermoſt corn is preſſed ſo dry that it is killed, and never works into malt, but * finnows; and by this means the ſour water not running off gives the malt a ſour and churliſh taſte, which never wears off.—The damage the undermoſt barley receives (as above deſcribed) from the cloſe preſſure of it puts me in mind of the common expreſſion of the country-man, who ſays, that when barley is firſt ſowed it ought to lie eaſy, the reaſon of which he knows not, but obſervation and experience confirms him in it.—From hence, it may not be improper to borrow a hint how to account for the reaſon of it:—it ſeems to me, as ſome creatures, for example amongſt fiſhes the eel, or the miller's-thumb will live with leſs air than other fiſhes, ſo alſo it is with corn, amongſt which ſome ſorts of grain are eaſily ſuffocated and choaked, and the vegetable punctum ſaliens (or heart) ſtifled for want of a ſufficient pabulum of air in it's tender infancy, when oppreſſed with heavy wet clay; whereas in more porous earth, which lies light, and whereby there comes a freer acceſs of air to the ſeed, the vegetable progreſſion is ſupported and carried on in the ſeed.—I think it may well be made a quære whether barley ſowed in a pot of mold, and put into an air-pump, where the air is drawn out, would not rot and finnow, inſtead of growing,—and whether, if the ſame experiment was to be made on

* molds.

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[a] This rule contradicted § 19—at leaſt in pale-dried malt.

on barley and wheat put into an air-pump, the wheat would not ſpear out with the help of a leſs quantity of air than the barley, becauſe we ſee wheat will grow under a cloſer, heavier, wetter, and colder earth, from whence the air is more excluded, than barley will do.—Thomas Beckley of Bourn, maltſter, ſays much to the ſame purpoſe with Mr. Hillman, and that ſometimes the keeping the barley longer in couch than ordinary for the exciſeman's coming contributes to the ſouring the malt; and the cloſe preſſing it in the ciſtern, by the deepneſs of it, whereby it lies the harder, hinders it alſo from coming.

To know when barley is fully malted.

§. 13. An old and an experienced honeſt maltſter did aſſure me,--that if the germen, or the ſpire-end of the barley, which runs between the flour and the rind, was not as high aſcended between the rind as the root-end was put forth, ſuch barley-corn was not fully malted, and that no more of the grain would be converted to flour than as far upwards as the point of the germen ran, and that by biting the grain one might find the difference; for that part of the grain not malted would be hard and tough, and being ground would be fat, dauby, and clammy in the liquor, and would not drink it up.

My maltſter ſent me malt, which my butler was not pleaſed with; he ſaid, there were many grains in every handful of it, which were not malted at all, and many grains that were but half malted, of which I might be ſatiſfied, if I made trial in water; for the corn, which was not malted at all, would ſink to the bottom, and the half-malted grains would ſwim an-end, like a fiſhing-quill.—I called for a baſon of water to make the experiment, and found it to be true.

Of the increaſe in malting.

§. 14. The maltſters have frequently a buſhel and an half increaſe in the quarter, when they do not ſcreen the coomb well, but in the London-trade there is not above a buſhel increaſe to be had, becauſe for that market the malt muſt be made very * knot: if malt be ſent to London, and be not made knot, it will heat, and the coomb fall off in ſifting, and tumbling it out at the wharf, and then it will not hold out the meaſure it was ſent for, which will occaſion diſſatisfaction between the factor and the maltſter.

Of pale-dried malt.

§. 15. I find they agree, that pale-dried malt, if care be taken to give it it's gentle heat with a ſoft fire, may be dried as hard as the higheſt-dried malt, though generally ſpeaking the pale-dried malt is ſlacker dried; but in caſe time be taken in drying it well, they know not why it ſhould not make as ſtrong drink as the high-dried malt, and both the malt and the drink keep as long.

Of wheat and oat-malt.

§. 16. Mr. Edwards ſays, that he has uſed, and brewed with a buſhel of wheat-malt, and twelve buſhels of barley-malt to the hogſhead to his very good ſatisfaction.---He alſo ſays, that Sir Robert Sawyer uſed always to put wheat, beans, and oats to his malt.---He likewiſe ſays, that a buſhel or two of oat-malt to twelve buſhels of barley-malt will ripen the drink much ſooner;---and further, that oat-malt and barley-malt equally mixed, as many of the country people here uſe it, makes very pretty, pert, ſmooth drink, and many in this country (in Hants) ſow half barley, half oats for that purpoſe, and call it Dredge.

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* fine, clean.

Of fern-dried malt.

§. 17. 1696. Fern-dried malt is not of late years looked on to be ſo good as malt dried with other fuel, though ſome years ago it was in vogue, but people ſoon found their error: it uſed formerly to yield 2 d. in the buſhel extraordinary, but now it yields 2 d. in the buſhel leſs.---It makes the ale taſte maukiſh.

Of burnt malt's recovering by keeping.

§. 18. If malt be burnt, the longer it lies by the better it will recover itſelf, loſe it's heat, and look paler: I had ſome drink made of malt, that being raſhed would have been quite ſpoiled, had it been uſed directly, but by keeping it a year and an half by me it was ſo well recovered, that there was no loſs in it.—Pale malt is beſt to be brewed as ſoon as it is ground, but the high-coloured malt is better for being kept a while after it is ground before it be brewed, becauſe it is too hard to break to pieces, and molder in it's flour, till the air by being imbibed has looſened it's parts.

Of new and old malt.

§. 19. I find by my own, and the experience of other obſerving maltſters, that for brewing drink malt is in perfection about three weeks or a month after it is made; for by that time the fire will be out of it, and it will then be fulleſt of ſpirit; whereas the more it ſlackens afterwards the more the ſpirits go off, and with them the ſtrength of the ſmell abates, as may eaſily be perceived.—Therefore, though malt takes leaſt damage kept in a great heap, yet I find they all agree, that one had better make October drink with new malt than with old, becauſe, if both years barley be equally good, the new malt will brew ſtronger drink than the old, but this more eſpecially holds in pale-dried malt, becauſe it may ſo happen that high-dried malt may be ſo ſcorched as not to be mollified, or have the fire enough out of it for brewing till many months after it's being made, and by long keeping that ſuffers leaſt.

They hold that it is more profitable for the maltſter to ſell old malt than new, becauſe, before it is ſlacked, and while but newly come from the kiln, much more goes to the buſhel.

HOPS.

Of ſetting the hop-hillocks at a diſtance.

§. 1. [a] MR. Perdue, the greateſt hop-merchant in Wincheſter, ſays, he ſets his hop-hillocks at double the diſtance others generally do, and that he is ſure he is a gainer by it; for thereby in poles, and otherwiſe, he is but at half charges, and has as good a burden of hops as other people; for the ſun having power to ſhine through the poles, and to ſtrike it's heat to the bottom, brings bloſſoms from the very bottom, the ſap being checked and dried up by the ſun, whereas, when the poles are ſet thick, the hops carry bloſſoms only at the top.—Quære whether the ſame reaſon holds not, for ſetting beans thinner.

§. 2. Hops

[a] Our author having but few remarks on hops, they, who deſire information in this particular, may conſult Mr. Miller's Dictionary, under the article Lupulus, where they will find a full account of this plant, with ſeveral curious experiments made by the Reverend Doctor Hales.

Of chooſing hops.

§. 2. Hops that feel clammy are the beſt; therefore may be choſe in the dark.

Of the hop-ſeed.

§. 3. The true vertue of the hop lies chiefly in the ſeed, and not in the leaf, which but few underſtand; they chooſe the hop by the colour of the leaf, whereas the brighteſt leaved hops are the worſt ſort, becauſe they are not full ripe, and conſequently were gathered when the ſeed was in the milk, whereby it ſhrinks to nothing; but the hop in perfection has a nut-brown leaf, and it's ſeed being full ripe has a good pith; which is what gives the grateful bitter, though the generality of people are ignorant of this.

Of hop-poles.

§. 4. Hop-poles for the ſecond year ought to be ſixteen foot long, the firſt year wanting none; the third year they ought to be twenty foot long; after that twenty-five foot, and never longer.—If the girt of a twenty-five foot pole be eight inches at the bud-end, it is reckoned a compleat pole: aſh is better for poles than withy by five ſhillings in the hundred, in the twenty-five foot poles.

GRAZING.

Jews ſkilled in the management of cattle.

§. 1. IT ſeems to me (as before hinted) that the Grecians, Romans, Phœnicians, &c. derived their huſbandry from the Jews; for it is not to be ſuppoſed but that Abraham, Iſaac, and Jacob, and his ſons, who were ſuch wiſe perſons as they are recorded to have been, and ſo converſant in cattle, muſt be excellently ſkilled in that branch of huſbandry. See Gen. xxxiv. 5.—And that Jacob's ſons were wiſe perſons may be ſeen by their conduct before Joſeph their brother.—That Moſes, who was ſo excellently ſkilled in all the learning of the Ægyptians, and afterwards kept his father Jethro's flock forty years, muſt by means of his advantages in education have made vaſt diſcoveries in the nature of cattle is moſt certain, and what converſe the patriarchs had with all the eaſtern nations, whereby thoſe nations might be informed, is well known.

Antiquity of this branch of huſbandry.

§. 2. Doctor Patrick in his comment on Gen. xxix. obſerves that Rachel's name in Hebrew ſignifies a ſheep.—And Varro derives many antient families from the names of cattle. Lib. 2. c. 1. De re ruſtica.—And lib. 1. fo. 29. he ſays, the paſtoral care was the firſt imployment in the world, and that agriculture came in of later years.—It ſeems indeed that thoſe names, that honourable families antiently aſſumed to themſelves, were borrowed from the names of cattle, as thinking the paſturage of them more profitable than tilling the ground;—and we find of Jacob, notwithſtanding his flocks were ſo large, that yet his proviſion of corn was but from year to year; for in the ſecond year of the famine in Ægypt he wanted corn, ſo that it ſeems he thought it more profitable to trade in cattle, and their fleeces, than to go to markets with corn.—It is to be obſerved that Rachel kept the ſheep, as being an honourable imployment, not but ſhe had others under her as aſſiſtants and ſervants.—GOD himſelf is named the ſhepherd of Iſrael: ſheep-ſhearing, not reaping of corn, was their greateſt feſtival. See Patrick, fo. 506.—In the hot countries it appears, that their cuſtom was to bring their flocks to wells, and into ſhades, to drink in the heat of the day, and, when that was abated, to drive them to feed again, as appears from Geneſis xxix. 7.—It is yet high day, &c. See Doctor Patrick's Comment; and Cant. i. 7.—and Palladius in his Calendar ſays, that the cattle uſed to be drove out to feed in the ſummer evenings, when the dew firſt began to fall, ſo that then they uſed to tend their cattle late, and the morning dew was alſo taken by them, which, and Virgil's ſaying, Et ros in tenerâ pecori gratiſſimus herbâ, is contrary to our practice, and ſee Varro, l. 2. c. 15.--Notwithſtanding however what may have been conjectured by various writers, and the preference given by them to the paſtoral charge, in regard to it's antiquity, it is plain from Geneſis iv. 2. that and agriculture were near of the ſame date, for Abel was a keeper of ſheep, and Cain, the elder brother, a tiller of the ground.

Of the colours of cattle.

§. 3. Mr. Brown, in his Vulgar errors, fo. 41. obſerves, that, if ſheep have any black, or deep ruſſet in their faces, they want not the ſame about their legs and feet;—that black hounds have mealy mouths and feet;—that black cows, which have any white in their tails, do not miſs of ſome in their bellies, and if all white in their bodies, yet, if black mouthed, their ears and feet maintain the ſame colour.

Of party-coloured cattle.

§. 4. That Jacob's ſheep brought forth ſpeckled lambs, on viewing the rods at the time of conception, is imputed by Patrick to the Divine will rather than to the force of imagination; yet he owns, that St. Auſtin, and ſome others, imputed it to the operation of natural cauſes, and alledges the like thing done in Spain between horſes and mares.—Lord Pembroke told me, it was common in Spain to cover a mare with a Turkiſh carpet, and to lay another before her, when they brought the ſtallion to cover her.—I have alſo obſerved, that it is a common expreſſion, on ſeeing a party-coloured horſe, to ſay, "He was "begot on a common:" it being ſuppoſed, that there the mare might, at the time of conception, have ſeveral different coloured horſes in view.—But no wonder that theſe arts are not mentioned in the Rei ruſticæ ſcriptores, they not being practiſed by the Romans; for their endeavours were to avoid party-coloured breed, either in ſheep, horſes, or horned cattle; for which reaſon they would not keep ſuch cattle of any ſort, of either ſex; and it ſeems to me, that Jacob propoſed to Laban the ring-ſtreaked, ſpotted, and ſpeckled cattle for his hire, not only as unlikely to proceed from the white cattle, but alſo as the cattle of leſs value than the white cattle; for in theſe countries, as has been before remarked, they did not affect cattle of medly colours, and, as it is likely, becauſe they thought thoſe cattle of the worſe natures, as not having been created ſo from the beginning; all cattle at firſt being of one colour in the ſame individual, as black, white, red, &c. and the mixture of colours whereby their natures are weakened, ariſing from the copulation of males and females of different colours.

Cattle in low caſe not to be put into rich land.

§. 5. The ſtronger and richer the land is, the more muſt cattle be kept up to a good pitch; for, if on ſuch land cattle are in the winter ſuffered to run to poverty, or are brought into it poor, they'll be liable to the yellows, and the blain, and moſt ſort of diſtempers; for it is the ſame as if you ſhould offer ſtrong meats to weak ſtomachs, or to perſons in a low eſtate of health.—It was agreed by farmer Chivars, farmer Harding, farmer Earle, and farmer Stevens of Pomeroy (notable Wiltſhire dairy-men) that cattle in good caſe, and in heart, would for a little while feed on the coarſeſt fodder, be it ſtraw, or hay, which cattle low in caſe, would ſtarve before they would touch, and therefore ſuch cattle have the weaker ſtomachs.

Obſervation on Virgil--- Et ros in tenerâ, &c.

§. 6. Great cattle chooſe to feed with their heads from the ſun both morning and afternoon, feeding a different way in the afternoon from what they did in the morning.—Our cattle in England, ſeem not to care to feed among the dew in the morning before ſun-riſe; but like to ſtay till the ſun has began to warm it; ſo that it ſeems, the ſaying of Virgil,—" Et ros in tenerâ pecori gra-" tiſſimus herbâ"—ſhould be underſtood in England of the dew after ſun-riſe; perhaps in Italy, where the days are ſo hot, and the graſs in the day-time roaſted with the ſun, the cattle may like to lick up the dew early in the morning, and doubtleſs in England our cattle vary much in their hours of feeding between ſummer and winter.

Cattle chooſe the higheſt ground in hot weather.

§. 7. I obſerve in the hill-country, that in ſummer-time cattle covet to paſture on the higheſt part of the field, for ſake of air, and go not down to the low part of the ground to feed, it lying cloſe from the air, till towards the evening, when the bottom of the field is alſo cool; the oxen likewiſe, which come from the plough, and are hungry, will go up to the height till towards ſun-ſet, though that part be very bare of graſs.—My ſhepherd ſaid, on a certain day, that he would drive my ſheep into the road on the waſte to feed, becauſe the day was cool and airy; for, ſaid he, if I drive them thither in a hot ſultry day, they will not feed, but will lie in the rutts.—The reaſon for their doing ſo, as I conceive, is, becauſe they find great relief by the ſtream of air which runs along the rutts, as in a channel, when perhaps no motion of air is ſenſibly to be perceived elſewhere.

Sign from their going to feed.

§. 8. When cattle in ſummer-time go late to ſhade, and come out from ſhade earlier than ordinary, to go to feed, it is a ſhrewd ſign their commons grow ſhort.

Of cattle tainting ground.

§. 9. Large cattle will taint poor ground with paſturing on it, and will make mamocks, that they will leave and not eat; when at the ſame time, in rich land, and a good paſture, they would eat up all the graſs clean; and that this ſhould be ſo ſtands to reaſon, becauſe, at beſt the poor ground not being very toothſome, a little addition to it of unſavourineſs, by piſſing or dunging, will occaſion the cattle to forſake that part, eſpecially about June, when poor ground begins to fall off from growing; whereas in good ſweet ground the taint does not near ſo much overcome the ſweetneſs of the graſs, and for variety's ſake it may be pleaſant and grateful to the cattle, there being ſtill a conſiderable degree of natural ſweetneſs left to recommend it.---In poor grounds, ſuch as hill-country-downs, the ſheep will feed them down cloſe, notwithſtanding the ill ſavour of their tails: the reaſon for the ſheep feeding them ſo bare and cloſe is apparent; for, wherever they lay their tails, there is time for ſuch part to out-grow the taint, the graſs being always kept young, and tender, and in a ſpringing and growing condition, which is not the caſe in poor hill-country ground ſet apart for paſture for great cattle, which muſt therefore be hained, ſo as to be raiſed to a good bite, for the graſs that may be tainted in ſuch paſtures, is of a good length, and the greateſt part that is above ground is tainted; when great cattle therefore are forced to eat it, they may be obſerved to walk along biting the tops of it; that is, ſuch part as has grown up ſince the taint.

Of feeding clover.

§. 10. In caſe you deſign the feed of the ſecond year's broad-clover for your cows and horſes, as not having provided new broad-clover for them, of one year's growth; ſuch ſecond year's broad-clover, deſigned for the ſupport of your cows and horſes, ought not, in our hill-country, to have been fed the firſt year, but with cows, and a few horſes; for if ſuch ground be fed with ſheep the firſt ſummer, it will much damage the produce of the ſecond year; becauſe they will wound, and bite into the roots of the clover.

Cattle fed in broad-clover need little or no water.

§. 11. It had been a very dry and burning hot ſeaſon for ſix weeks, during the latter part of April, and all May, (anno 1702) and I had an hundred ſheep and three beaſts fatting in broad-clover: I often thought my ſervants had neglected to drive them to water; for they had no water in the paſture: ſo, not truſting to my ſervants, I drove my fatting-cows myſelf, in the evening, to water, but could not perſuade them to taſte it, neither that day, nor the next; I alſo drove my ſheep to water, and waited patiently on them half an hour, but could not perſuade them to touch it.—I obſerved the dung of the ſheep to be very moiſt; and fat, and pappy like cow's-dung; whereas, when ſheep feed in other graſs, they are naturally very dry, and coſtive; from whence I infer, that the leaves and ſtalks of the broad-clover being ſo juicy, no cattle need ſo much water with it as with other graſs, if they may not even do without any at all.

Of cattle ſwelling in broad-clover.

§. 12. Farmer Miles of Holt aſſured me, that about them, in Wilts, oxen and cows were in great danger of being ſwelled by being put into broad-clover, whenever any rain came, though it was dry when they were put in: they had alſo, he ſaid, in thoſe parts, loſt ſheep by putting them into broad-clover, and into green wheat likewiſe, in the ſpring.—I ſaid, I had this ſpring (anno 1720) fed my wheat down with my flock, by putting them in for two hours in a morning, after they came from fold; and I had found no hurt by it.—He replied, he ſuppoſed that would do them no harm, but what harmed them was keeping them in longer, and letting them lie down.

Of letting out the wind from a beaſt ſwelled by broad-clover.

§. 13. A farmer in my neighbourhood had like to have loſt ſeveral oxen this year, (1720) by putting them into broad-clover, though he watched them: one of them being ſo much blown, that he thought he could not be ſaved, the farmer ignorantly ſtruck the bullock with his pen-knife into the hollow place under the free-bone, under the loin, which was wrong, and the bullock died; whereas, he ſhould have taken a pair of ſtrong pinchers, and in that hollow place have taken hold with them on the bullock's hide, and have pulled it from the fleſh with all his ſtrength, and then have ſtruck his pen-knife into the hide only that he had looſened, and not into the bullock's fleſh, whereby his guts were hurt, but, inſtead of that, ſhould have run it in between the hide and the fleſh, and a wind would have iſſued out ſtrong enough to have put out a candle.—In caſe a bullock, not thus blaſted, has a blain, do the ſame thing, by lifting up the hide in the ſame place, and then make but a ſmall orifice, ſo as to thruſt in a pen-knife only, and a great deal of wind will iſſue out.

I was ſpeaking afterwards to an old experienced farmer on this ſubject, and he ſaid, he had not in thirty years time loſt a cow by broad-clover, nor did he think it more dangerous than other graſs, unleſs cattle came hungry to it out of the ſtraw-barton, or were very poor in caſe; for then they would knaw it unreaſonably, and it was very groſs and windy; but cows that had the ſame ſpring been firſt in other graſs, would not be very greedy of it, nor would, in that caſe, over-fill themſelves; for they will eat any graſs of the field before broad-clover.

I believe broad-clover is not ſo apt to hurt cattle on our dry hills as on the deep lands.—I alſo believe, the thicker it is ſowed it is the leſs apt to hurt, becauſe it runs the finer.

The reaſon, as I conceive, why broad-clover is apter to blow a cow than a horſe, is, becauſe a cow licks it in with her tongue, at a greater length, and ſwallows it larger than a horſe does; for he chews it more, as not chewing it over again as the cow does in the cud, and ſo it goes firſt down into the cow's ſtomach more groſs, and with leſs of the ſalival juice to correct it than that which the horſe ſwallows down has.

Another farmer of my acquaintance in Wiltſhire had two beaſts died with the riſe of graſs, by putting them into the aftermaſs of his mead, which was very luſcious, it having had a mighty quick growth, occaſioned by warm rain; and his cattle having for ſome time fared hard, they eat ſo greedily on their being firſt put into the aftermaſs, that they quite choaked up their firſt ſtomach, called the fardingbag; for, upon opening the cows, that ſtomach was found full of raw indigeſted graſs.

Mr. Bachelour of Aſhmonſworth, and farmer Crapp, and farmer Biggs diſcourſing upon broad-clover, farmer Biggs ſaid, by mixing it with hop-clover, he had never loſt a cow in his life; and ſo ſaid farmer Crapp.

On feeding oxen with hop-clover.

§. 14. The ſummer, anno 1717, being ſhowery, the hop-clover came up thicker than ever I knew it, and grew to that height among the barley, as, at harveſt, to flower; and we were forced to turn the barley-ſwarths, on account of the great quantity of hop-clover that we unavoidably cut off by the ſcythe with the barley.—I hoped therefore, that ſo great a bite of hop-clover, as my fatting-oxen might have after harveſt, would bring them forward, they being well advanced in fleſh before; and the hop-clover being ſweet, I had great expectations from it; but for a fortnight I could only keep my oxen to hold their fleſh, and then for another fortnight I found they loſt fleſh, though the bite of the clover did not ſo abate, but that it ſeemed thick enough to ſupport them: my working oxen alſo filled themſelves very well for near a fortnight; but when the head of the hop-clover was taken off, they fell off their fleſh.—My ox-hind ſaid, the cattle were forced to pull up ſo much of the barley-ſtubble with the graſs, that it greatly abated the goodneſs of it. From hence for the future I may learn experience, and know how far I may depend on ſuch hop-clover for fatting my working oxen.

Cows, ſheep, and all ſorts of cattle, will chooſe rather to feed on broad-clover, if it be kept down pretty cloſe, than on hop-clover, when it has once run into flower; for of the two the hop-clover is the bitterer.

What graſs beſt to fat cattle in September and October.

§. 15. My ground will almoſt fat cattle in ſpring, when the ſap is fluſh; but it muſt be the aftermaſs of good ground only, when September and October comes, that will ſupport a bullock, and carry him on when near fat: the poverty of graſs at that time may be ſeen by it's dying away, or loſing it's colour: then ſuch graſs is loſt on a bullock.

Of winter-rowet, &c.

§. 16. Mr. Biſſy (my tenant in Wilts) a very experienced grazier, was telling me, how much a beaſt would thrive with his winter-ſtraw, in caſe he had the liberty of going abroad, and, beſides his ſtraw, picking up ſome winter-rowet, which would give him a better ſtomach to his ſtraw.—I replied,—I found that by experience; but our hill-country-meads contained ſo few acres, they would not afford much winter-rowet; but, ſaid I, though rowet, which is of a deadiſh nature, and afforded the cattle little better than a change only, made the ſtraw more grateful, yet I obſerved, by giving them with their fodder a taſte of the firſt ſpring-graſs, which was luſcious and gnaſh, nothing would ſooner wean them from, and take them more off their ſtomachs, not only to ſtraw, but to the beſt hay alſo; and therefore I carefully kept them from ſuch graſs.——He replied, it was, generally ſpeaking, very true; but yet that their ſpring-graſs beaſts would (before the quantity of graſs was ſufficient for a maintenance wholly thereon) eat heartily of ſtraw or hay, early in the morning, and whilſt the dew was on the graſs; for in the ſpring the cattle do not care for ſuch graſs early in the morning, nor till it has been warmed by the ſun, and the dew taken off it; becauſe ſuch graſs is very cold by the wet lying on it, and the juices are then as yet unconcocted, and you may ſee the bullocks, at ſuch time, ſtand under the hedges, forbearing to feed till the dew is off.—All this ſeems very reaſonable, whereas on the contrary, in the ſummer-time, when the crudities of the graſs are taken off, all cattle are more deſirous of feeding in the mornings and evenings, while the dew is on the graſs; in which ſenſe only Virgil is to be underſtood, when he ſays,—" Et ros in tenerâ pecori gratiſſimus herbâ."

Oak-buds poiſon to cows.

§. 17. I lopt ſeveral pollard-oaks this ſpring (anno 1705) whilſt in bud, and let the loppings lie, in order to be faggotted: the beaſts of the common came and browſed on them, and the oak-buds killed five of the udder-cattle; ſee therefore, and prevent ſuch evil for the future.

Calves will not eat if they want water.

§. 18. I was telling my ox-hind, I doubted ſome weanling-calves I had wanted water.—He ſaid, that was eaſy to be ſeen; for, if they ſuffered for want of water, they would not fill themſelves, though there was never ſo much graſs, but would look mighty hollow and thin, and go about bleating.

[a] Varro adviſes to water cattle twice a day in the ſummer and once in the winter.

This winter (anno 1718) I was fully convinced of the great advantage it was to cattle to have water at command in their foddering-yards, ſo as to have recourſe to it when they pleaſed; for the cattle in my cow-yard, where they have no water, (but when they are drove to it, and that but once, or at moſt twice a day, and ſometimes are neglected, or drove unſeaſonably) were in general much more out of countenance, and leaner than four or five cows that the parſon joiſted for me, and which fed on the ſame ſtraw, it being the tythe of my farm.—The difference lay only in this, that his cows went when they would to the pond in his yard.—Gentlemen-farmers, having ſo many irons in the fire, ought to depend as little as may be on ſervants, but ſhould provide ſuch conveniencies as may, as much as poſſible, anſwer the ſame ends, without the care and trouble of ſervants.

I wintered this year (1719) twenty two-years yearlings in the French-graſs, where they had alſo the running in the woods, and were foddered in the ſtraw-houſe, and thus they lived very luſty till March, when, the rowet being gone in the field, and the bud beginning to ſwell in the coppice, I was forced to remove them, and bring them wholly to ſtraw; I was afraid they would have been much pinched, their rowet being gone, and loſing their range, and being confined to the backſide; and for three or four days they ſeemed to look hollow; but then they filled again, and did very well, and I do not a little impute their doing ſo well to their having plenty of water at command, and to the warmth of the yard: I note this, that I may not fear the conſequence in ſuch another year.

Stalled-oxen not to be kept too cloſe.

§. 19. Stalled-oxen, if tied up to the houſe, which is cloſe, have been found of late years (ſince 1705) not to hold to their ſtomachs ſo well as when one ſide of the houſe is open, like a penthouſe; becauſe, when an ox grows fat, he is naturally very hot; therefore it is beſt to have the ſides of the fatting-houſes open.—In yoking-time, whilſt they plough them, if they ſlip a cord, they never fight, but when fatting, it is likely they may.

Of houſing cattle.

§. 20. Farmer Elford of Dorſetſhire ſays, that cattle, which are uſed to be houſed on nights in winter, will be tender, and expect it, and will in winter fall away in their fleſh if they have it not: therefore he, not having the conveniency of houſing them, takes care not to buy a cow, if he perceives ſhe has been uſed to be houſed.—I aſked him how he could perceive that by a cow in a fair; he ſaid, very eaſily; for ſuch a cow would have the hair of her ſides towards her tail clung with dung; which they, who bring her to market, cannot get off without great difficulty; the hair will ſooner come away than they can ſeparate the dung from it.

Cattle in proof require ſtrong bounds.

§. 21. Poor cattle may be kept to their good behaviour by ſlight incloſures; but by experience I find, that cattle well kept, and high in proof, muſt have very ſtrong bounds, elſe, when they riſe in caſe, they will ſoon break through, eſpecially if they want water, or take a diſlike to their paſture.

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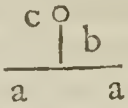
[a] Boves æſtate ad aquam apellendos bis, hyeme ſemel. Var. fol. 56.

A clog for cattle.

§. 22. The annexed figure repreſents a clog to hang at the bottom of a yoke, or ſhackle, to prevent a beaſt from leaping; it may be increaſed according to the bigneſs of the beaſt.



c, the hole through which the ſhackle comes.—b, eighteen inches.—a a, three foot long.

Of bells to hang on cattle when turned into the woods.

§. 23. Being to ſend five yearlings to the coppices, that I might hear whereabouts they were, I was to put on bells; ſo I bid my wood-man get withs for the bells. He ſaid, by no means; for a with would be apt to gall their necks, and the flies would blow the ſore places, and, beſides that, withs would be apt to hang in the buſhes; but a good ſtrong whitleather collar would do very well; but, ſaid he, an iron collar, made of a ſmooth plate, is better, and will not gall, and the bell will ſound much better than either with a with, or a whitleather collar; becauſe the iron collar holds the bell off from reſting on their breaſts; whereas, with the other collars, the bell lies on their breaſts, whereby the ſound will be deadened.

FODDERING.

Of convenient partitions in a foddering-yard.

§. 1. IN the foddering-yards of backſides, or other out-houſes, to have ſeveral diviſions, over and above what is conſtantly uſed, has great conveniencies in it; one of which is, that in them you may diſpoſe of a two-yearling cow, or another cow, at the time of bulling; not only to keep them from a bull, but from the other beaſts alſo, that would be leaping ſuch a cow, whereby they may hurt each other, &c.---Eſpecially cows forward with calf will be apt to warp by leaping a bulling-cow.

Cattle, if once foddered, will not do without it.

§. 2. The open winters make hay the deareſt, if a hard froſt and ſnow come at the forehand of them; for if cattle once come to fodder, they muſt be held to it, or they will receive great damage.---In waſhy weather all the hay one can give to cattle will not make them thrive, but in dry froſty weather they'll thrive with their meat.

Cattle grow louſy on bad hay.

§. 3. I am aſſured by a farmer of Woodhay, in my neighbourhood, in the vale that there is abundance of hay there ſo four and ruſhy, that it is not ſo good for cattle as ſtraw in a good year, and he has known cattle grow louſy on ſuch hay.

I was telling this to another farmer, and he ſaid, it was true, and that ſuch fodder ought to be given to cattle but a little at a time, ſo as not to cloy them;

for, if they ſhould be once cloyed with it, they would ſtarve rather than feed on it.

Cows uſed to hay will not eat ſtraw.

§. 4. Anno 1704, I let my cows go at large from their foddering-yard, during the winter, and ſo on till April, when they picked up ſome graſs; and thoſe that had calved I baited with hay: the conſequence of which was plainly this, that by Mid-April my cows would not ſtand to eat any ſtraw at all, but were, during the months of March and April, ſo weaned from ſtraw, by baites of graſs and hay, that they fell off from their ſtraw quite, and grew much leaner, and worſe in fleſh than they had been, and apparently worſe than the farmer's cows, which were, after the winter months, wholly pent up to their ſtraw, and to the pond.

Cattle that chew the cud like not to eat after one another.

§. 5. All ſorts of cattle that chew the cud, as ſheep, cows, &c. care not to graze after each other, nor to eat one another's leavings in the foddering-yards; but cattle that do not chew the cud will eat after thoſe that do, and vice verſa.

Of chaff.

§. 6. [a]Pliny tells us, where hay was ſcarce it was uſual to feed their cattle with chaff and barley-ſtraw. Of chaff, ſays he, that is the beſt ſort, which is the thinneſt and ſmalleſt, and neareſt to duſt; the beſt therefore is from millet, the next from barley, and the worſt from wheat, except it be for hard labouring beaſts.

Cattle muſt not be ſent from the foddering-yard, in the hill-country, till the middle of May.

§. 7. On ſound experience I am convinced, that in our hill-country we ought not to have any dependance on ſending our cattle out of the foddering-yard to graſs before the middle of May, and therefore we ought to be provided with winter-fodder for cows accordingly; for this year (1720) there was a very wet ſpring, and it continued ſo throughout March, April, and May, and yet the natural paſture-grounds did not afford a bite for the great cattle till the middle of May; indeed the hop-clover might be fit to ſupport them a fortnight ſooner; but it is a hard matter, tho' one ſhould have a good ſtock of that graſs, to get the ſhepherd's leave to hayn it from the ſheep for that end, he ſtands ſo much in need of the hop-clover graſs for his ſheep from the middle of March to the beginning of May.

To fodder early in winter mornings.

§. 8. At the beginning of winter, ſuppoſe the latter end of October, and a good part of November, while cattle ſtill continue out in the field at graſs, it is very neceſſary to fodder them early in the morning, while the hoar-froſt hangs on the graſs, which they will not eat kindly of till the ſun has warmed it.

Of racks.

§. 9. The ſtradling racks are beſt for foddering, if made ſtrong enough, i. e. ſo as not to be overturned; for theſe racks may be lifted up as the dung mixen riſes, which thoſe fixed in the ground cannot be.

Cribs better than racks in the hill-country.

§. 10. It is a practice in many places, eſpecially in the vale, to tie their cow-beaſts up to a rack to fodder; but if one rightly reflects on the places where it is done, we ſhall find it only uſed where the fodder is good, being either hay, or very good ſtraw; but in the hill-country of Hampſhire, where the cattle have ſtraw-fodder only, and that not ſo good as the ſtraw in the vale, the cuſtom is to fodder their cows in racks, or cribs, in the open yard, which they think better than tying their cattle up to racks in houſes; for tho' in cold and rainy weather the houſes may keep their loins dry, yet in countries where the fodder is coarſe, eſpecially after wet and backward harveſts, when the ſpirit of the ſtraw is waſhed out by the rain, the giving cattle ſtraw from racks, from whence they cannot pick and chooſe, as from cribs they may, is judged to tend to the impoveriſhing the cattle, whereas in cribs they can pick the ſweet from the coarſe.

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[a] Ubi fœni inopia eſt, ſtramento paleam quærunt, hordei ſtipulam bubus gratiſſimam ſervant:—Paleâ (chaff) plures gentium pro fœno utuntur; melior ea quæ tenuior, minutiorque et pulveri proprior, ideo optima e milio, proxima ex hordeo, peſſima ex tritico, præterquam jumentis opere laborantibus. Plin. lib. 18. c. 30.

Aſking a great grazier in Somerſetſhire, in what method he fed his fatting-beaſts, he told me, he thought it was beſt for them to reach up to a rack.---I ſaid, I thought not, becauſe reaching and hawling might give frequent qualms to the ſtomach of a fatting-beaſt, eſpecially when near fat.---He replied, he did not know but it might; yet if you give them their meat from under them, they will blow upon it, and ſpoil half of it; ſo that, if their meat be given them from under them, it ought to be given to them ſo little at a time, that their breath may not taint it.

Rath-ripe ſtraw not ſo good fodder as late-ripe.

§. 11. My ſhepherd aſſures me, that my ſheep, and other cattle will not eat my ſpring-vetches made into winter-fodder ſo well as they will the winter-vetches, the halm of the latter having, he ſays, more ſtrength and ſpirit in it than that of the former, the halm of which is looſe and woolly.---This ſeems very reaſonable to me, for the halm of ſpring-vetches, and the ſtraw of rath-ripe corn of all kinds run in a parallel, as white, and black oat-ſtraw, rath-ripe, and late-ripe barley-ſtraw, and I believe the ſame may be ſaid of rath-ripe peas-ſtraw, and great partridge peas-ſtraw.

Several farmers in my neighbourhood have affirmed to me, that the ſtraw of the Patney barley, otherwiſe the rath-ripe barley, was hollower, and not ſo good fodder as the other; but farmer Farthing of the Iſle of Wight aſſures me, that his cattle eat his white oat-ſtraw better than his black; and Mr. Smith of Biſhop-Canons tells me, that his cattle eat rath-ripe barley-ſtraw better than late-ripe; ſo that it ſeems, the ſtraw of thoſe countries runs finer than ours, their land better agreeing with the grain.

Cattle prefer ſtraw that is juſt threſhed.

§. 12. There is a manifeſt difference in cattle's eating their fodder, when freſh threſhed, and when it has been threſhed two or three days, eſpecially if the ſtraw be but indifferent, and coarſe fodder.---I have been often ſenſible of this, but more particularly this year (1719) in foddering with peas-halm, when the cattle eat it very well all the week-days, while it was given to them as faſt as it was threſhed, but ſome, that had lain all Sunday on the floor, they eat but indifferently on Monday; and the more ſo, becauſe a dry cold wind had blown on it through the crevices of the barn-door.---This alſo the man, who threſhed the peas and gave the ſtraw to the cattle, ſaid was manifeſt to him.

Short ſtraw preferred to long.

§. 13. It is ſaid, the longer the halm of the corn is the worſe it is for fodder; the ſhorteſt ſtraw makes always the beſt fodder.

Oat-ſtraw bad fodder, and why.

§. 14. I aſked farmer William Sartain of Broughton, Wilts, his opinion of oat-ſtraw to fodder cattle with. His opinion was, that it ought not to be given frequently to cattle for fodder, but only a little now and then, by way of change; for, he apprehended, there was a roughneſs or harſhneſs in that ſtraw, which made the gums of beaſts, or the roofs of their mouths ſore, and ſaid it was the opinion of many that it ſet their teeth on-edge.--But whatever was the cauſe, or howſoever they were affected, certain it was, that after cattle had been held to oat-ſtraw a while they went off their ſtomachs, nor would they heartily fall to other ſtraw, nor even to hay, after it.---Another farmer afterwards in diſcourſe affirmed it was diſagreeable to cattle, and ought not to be given to them too often, nor too much at a time, and he thought that it's toughneſs might looſen their teeth by the ſtrength they were forced to uſe to chew it, and ſo it made them unfit to maſticate other meat for ſome time afterwards.

Barley-ſtraw of ſeed ſowed on one earth bad fodder.

§. 15. Farmer Biggs and farmer Crapp viſiting me, the former ſaid, he doubted his fodder would fall ſhort, becauſe he had ſowed ſo much of his barley on one earth, and his ſtraw was much the worſe for it.---Neither farmer Crapp nor I could well apprehend that: but ſaid he, the man who threſhed for me, told me, that he had obſerved it to be ſo.---I afterwards aſked ſeveral farmers and threſhers concerning it, each apart: they ſeemed to be at a loſs how it ſhould be,--but at laſt I found one, who readily replied, he had often heard it accounted ſo, and that the ſtraw of ſuch barley was much deader than that of barley ſowed on two earths, and that it would ſtarve cattle, if held long to it.---I can conceive no reaſon for it, except it is becauſe barley ſowed on one earth is generally ſowed on poor, light, or white land,---and ſo the ſtraw cannot be fed with ſo much ſap and juice as otherwiſe it might be, and therefore may be drier at harveſt than the ſtraw of corn ſown on richer land, and which in it's own nature may require two earths.---An old labourer of mine agreed with Biggs's threſher, and ſaid, he could tell one-earth barley from that ſowed on two earths by mowing it;---but I could not learn how.

Peas-halm for fodder.

§. 16. Mr. Smith of Wilts aſſures me, that, amongſt them, they give not barley-ſtraw to their horſes, but peas-ſtraw, if it be anywiſe well houſed, and that they always look on the great partridge peas-ſtraw to be better fodder (cæteris paribus) than the ſmall partridge peas-ſtraw. This I mention here, becauſe I have above noted, that rath-ripe ſtraw of all kinds is worſe fodder than late-ripe ſtraw is.---Mr. Smith alſo ſays, if their beans are well houſed, they give their horſes bean-ſtraw, and they eat it very well.

When peas-halm has fallen all along on the ground, and laid for ſome time, as it may ſometimes do, till the graſs ſhall grow through it, ſuch peas-halm is not fit for fodder, the leaves being in a manner rotted off, and the halm is only fit for dung.

Thiſtles uſed for fodder.

§. 17. If thiſtles are cut young, when they are withered the cattle will lick them up, though, whilſt they are green and growing, they will not touch them.

Elm-leaves good fodder.

§. 18. Elm-leaves gathered green, and ſuffered to dry in the ſun upon the branches, the ſpray being ſtripped off in Auguſt, will prove a great relief to cattle in winter, or in ſcorching ſummers, when hay and fodder is dear; the cattle will eat it before oats, and thrive exceedingly with it; but you ought to lay theſe boughs in ſome dry place, to prevent their muſting.—In ſome parts of Herefordſhire they gather elm-leaves in ſacks for their ſwine and other cattle: but ſome ſay, they are ill for bees, in that they ſurfeit of the blooming ſeeds, which make them obnoxious to the lark, and that therefore they do not thrive in elm-countries. J. Mortimer, Eſq. F. R. S. fo. 333.

More profitable to winter oxen than heifers.

§. 19. In winter an ox will pay better for his hay, and thrive faſter than a heifer, though her calf ſhould be young within her;—therefore 'tis more profitable to winter oxen than heifers.

FATTING of CATTLE.

Graſs, tho' plenty of it, from poor land, not good to fat oxen.

§. 1. THO' graſs of a middling goodneſs may raiſe a beaſt to be half fat, yet ſuch graſs, tho' the bite be never ſo deep, may not be able thoroughly to fatten him, but he will ſtick there, or mend but very little; for tho' a lean beaſt will feed greedily till he is half fat, yet afterwards he will grow nice, and require to be tempted with ſweeter meats; otherwiſe he will not feed beyond hunger: therefore perſons ought to conſider their land, and have a care how they reſolve on fatting of cattle, becauſe they think they have plenty of graſs and a good bite.—Nor does it follow, becauſe French-graſs, hop-clover, or rye-graſs will fat, that therefore ſuch graſſes, when they grow on poor ground, will do the ſame, tho' the cattle may have a full bite; therefore ſuch ground ought to be applied to the breeding of cattle.

Of fatting cattle in Jamaica.

§. 2. Dr. Sloan ſays, fol. 84.—The true way of fatting cattle, as I was informed by the graziers of Jamaica, is by bleeding them in the jugular vein, (which will ſtop of itſelf) and then purging them with aloes, or ſempervive-leaves cleared of their outward ſkins.—Much the ſame method is often uſed by ſome graziers in the north, eſpecially if their grounds raiſe a bullock very faſt, as I ſuppoſe the land in Jamaica may do.—Dr. Sloan ſays, the leſs nouriſhment the graſs affords the bigger the paunches of the beaſts that feed on it; ſo that the bellies of cattle, in dry times, in hot countries, are as big as if they were with young.—It would be the ſame with all ſorts of cattle in England alſo, if you ſtarved them.

Of fatting a young bull.

§. 3. I was ſaying to Mr. Bachelour of Aſhmonſworth, that I approved of cutting a young bull before his being put to fatting; he ſeemed to wonder at it, and ſaid, that he, and all the neighbourhood uſed to fat a young bull without gelding him, and they ſuppoſed, except he was not fatted till the next year, he would fat the better for it, and he was ſure it was ſo of a ram, and to keep him till the year after would not pay charges.

Of fatting a bullock.

§. 4. In fatting a bullock in Hampſhire in the winter they uſe, by the latter end of October, when the goodneſs of the graſs is gone, whereby he became half fat, to give him hay, and then to finiſh him with corn and hulls; but they ought to be wheat-hulls; thoſe are much the beſt; and it is much better to give him threſhed corn than oats in the ſtraw; for of them he will make great waſte.

There is nothing cheaper, to raiſe a fatting-bullock with, than ground-barley mixed with chaff.

Of fatting a heifer with a new-made ox.

§. 5. A Wiltſhire grazier ſhewed me a three-year-old bull in January 1698, which he had gelt a fortnight before Michaelmaſs, and had then in fatting, along with a heifer; for, he ſaid, they would fat more kindly together, and it would very much improve their meat. His way was, to drive the new-made ox and the heifer to houſe on nights, and there give them their ſupper, and in the morning their breakfaſt, and then let them out to fodder with the milch-cattle; for keeping them warm in the cold nights did much favour their fatting.

Time of buying in lean beaſts.

§. 6. About the beginning of November, when it may be ſuppoſed the graziers have diſpoſed of many of their high-fat oxen, and the plough-man has ſowed his crop of wheat, and caſts off oxen, then will the markets be open for lean oxen, which the graziers buy to eat up the * oughts, and rowety graſs the high-fat oxen had left; and then with ſtraw or hay they keep them in a thriving condition till ſpring, when they begin to fat them; but from the beginning of November to the middle of December is the chief time of ſelling them.

* leavings.

Quantity of hay a ſtalled ox will eat.

§. 7. A ſtalled ox in the winter, if he be kept to hay only, will eat at leaſt a load every two months.

How long an ox is in fatting.

§. 8. I aſked Mr. Biſſy how long an ox would take to be fat; he ſaid, a good ox muſt be in good caſe at May-day, when he is put to graſs to be fatted, if he is deſigned to be got fat by Allhallow-tide, which is about ſix weeks before Chriſtmaſs; nor will he be fat then without ſome hay: but, if any grazier ſhould order his grazing ſo, as not to get his oxen fat by that time, but muſt be haying all the winter,—unleſs beef be at three-pence half-penny or four-pence per pound, he can get nothing by it.—I aſked him how then it came to paſs that we had any ox-beef in the markets at the latter end of winter; he ſaid, ſome people were no wiſer; but there were often beaſts put to fatting, that would not be fat ſo ſoon as others, and ſome people over-ſtand their markets by ſetting themſelves a price, under which they will not ſell, hoping beef will be dearer, and at laſt are forced to ſell; then there are cows that come in with-calf unſeaſonably, and they muſt be fatted, be it when it will.

Of fatting a heifer that has not been bulled.

§. 9. Farmer Lavington of Wiltſhire ſays, that a heifer, that has never been bulled, will not take fatting ſo well as if ſhe had; but if ſhe has had a calf, or has warped, ſhe will fat very well, though not bulled, when ſhe was turned to fatting.—But Mr. Clerk of Leiceſterſhire ſays, it is not ſafe to truſt to her fatting without having her bulled.

§. 10. I

How ſoon a calf will make beef.

§. 10. I aſked Mr. Clerk how ſoon a calf would make beef; he ſaid, a cow-calf would make very pretty beef at three years old, but, if killed ſooner, they called it beviſs; nor would an heifer prove in fat till that time, not being paſt growing; for which reaſon ſteers will not be beef till four or five year old, becauſe they will be ſo long growing; therefore it is only profitable for thoſe countries to fat ſteers that plough them.

The ſooner a cow goes to the bull the ſooner her milk dries—therefore to be fatted.

§. 11. I had an old black cow brought a calf in the beginning of July, the cow being high in caſe: the queſtion was, whether I ſhould keep her over the winter, for ſake of her winter's-milk, ſhe having calved late in ſummer, or ſhould make the beſt I could of fatting her, ſhe being well in caſe. So I aſked the farmer's wife, if ſuch a cow, being old, would give milk all the winter; ſhe replied, according as ſhe ſhould take bull; the ſooner ſhe took bull ſo much ſooner her milk would dry up—Now ſhe, being high in caſe, would ſoon take bull; ſo I looked on myſelf as anſwered.

§. 12. An old cow, or an old ſheep, will not fat near ſo well with hay as with graſs.

Ground oats or barley to fat an old beaſt.

Mr. Clerk of Leiceſterſhire ſaid, he commonly gave a bull, or an old beaſt, when they were got pretty well in fleſh, (if corn was cheap) ground-oats and ground-barley; he ſaid, it would improve them much; he gave it them dry, and it would make them drink abundantly.

Malt-tailings or duſt.

Mr. Putchin, and Mr. Olderſhaw of the ſame county aſſured me, they knew of nothing ſo good to plim a horſe, or an old cow, as the tails of the malt, or the larger malt-duſt; the proportion was, to boil two quarts of malt-tails in ſix or eight quarts of water, and to give it two or three times a day:—it would, they ſaid, fat an old cow in ſix weeks time, ſo that ſhe would feel very well to the butcher, but then, ſaid they, ſhe would deceive him; for it cannot be expected that fleſh blown up ſo ſoon ſhould carry any quantity of tallow withinſide.

What ground beſt to make a beaſt tallow.

§ 13. Falling into company with an ancient butcher, I aſked him, what ground he judged beſt for giving tallow to a beaſt. He ſaid, old graſs-ground, if fat, though lying high and dry, would do very well till towards Midſummer, but it would then fall off, at which time the lower and moiſter paſtures would tallow much better: he ſaid, ſuch paſtures were good for tallowing all the year round.

Turnips not good to fat cattle after Chriſtmaſs.

§. 14. It has been found by experience, that turnips do not fat cattle well after Chriſtmaſs; they grow hollow and ſticky; but they will do very well for folding ſheep.

Broad-clover not fit to fat cattle after October. Meadow-aftermaſs beſt.

§. 15. A butcher came to buy an old cow of me; ſhe was near fat: it was October the 13th, anno 1702; he ſaid, if he bought her, he would keep her till Chriſtmaſs in aftermaſs-graſs, for my broad-clover would raiſe her no higher.—I ſaid, I thought ſo too; for the broad-clover leaf, being ſo very broad, held a dew on it, at this time of the year, all day long, whereby the cattle fed half on water; beſides, the juice of that graſs was too watery at this ſeaſon; but the meadow-aftermaſs is ſoon rid of the dew, within three hours of the morning, and does not hold it like broad-clover.—This I learned by having occaſion to carry ſome aftermaſs broad-clover hay to dry, and to ſpread it abroad, which I found was to no purpoſe on a broad-clover ground; and yet I did it with good ſucceſs on the rye-graſs, though of a deeper bite than the broad-clover.—A farmer of my neighbourhood coming afterwards, aſked the above butcher's father, whether it was beſt to fat a cow in broad-clover or meadow-erſhe at this time of the year. The old man ſaid, the meadow-aftermaſs was abundantly the better, and gave my reaſon for it, without knowing what had paſſed between his ſon and me.

Hop and broad clover hay not good to fat large cattle. See Graſſes, §. 16.

§. 16. Farmer Sartain ſaid, he had experienced, that hop-clover and broad-clover hay would not prove a bullock in fatting;—But quære, whether this may not only hold good in the great oxen of Wiltſhire.—Surely ſmall beaſts, ſuch as are in our hill-country, may do very well with thoſe ſorts of hay.

Meadow-aftermaſs beſt.

§. 17. I aſked Mr. Biſſy what aftermaſs would raiſe a beaſt in autumn ſo as to finiſh him; he ſaid, in the ſpring almoſt any ground will raiſe a bullock, the ſap being then fluſh; but it muſt be the aftermaſs of good ground only, when September and October come, that will hold a bullock, and carry him on when near fat; for though, by hayning up a ground early, after mowing or ſummer-feeding, there may ſeem to be a great bite of graſs in it, yet, if ſuch ground, by reaſon of it's poverty, ſhould fall off of it's ſtrength in September and October, which may be ſeen by the dying away, or the fading colour of the graſs, it is loſt on ſuch a bullock.

If one has natural aftermaſs-graſs able to keep up a bullock from September to Chriſtmaſs, it will pay for keeping an almoſt fat bullock or cow, if ſhe be not too forward with calf; and the reaſon is, becauſe there is but a ſmall part of England that have natural aftermaſs at that time of the year, fit to fat with, in proportion to the ſummer-clover every one has fit for that purpoſe; beſides ox-beef is not then come in, and cows are generally too forward with calf.

Of French-graſs hay to fat a bullock.

§. 18. I aſked Mr. Biſſy if French-graſs hay was fit to fat a bullock with; he ſaid, the Somerſetſhire graziers going to London had often aſſured him, that, if French-graſs was cut early in flower, it would fat cattle very well till towards ſpring, but then it grew too dry.

What quantity of hay will fat an heifer.

§. 19. By diſcourſing with Mr. Biſſy about winter-fatting I find by his experience, and the neighbourhood's, who have kept the account, and weighed the hay, that a good heifer put up to winter-fatting on hay would eat at leaſt two hundred weight of hay per week, which at thirty ſhillings per ton, or eighteen-pence per hundred weight, will come to three ſhillings per week, and at that rate her fatting for twenty weeks will coſt three pounds, and in leſs time a heifer, that is not very forward when put up to hay, cannot be fatted; yet at this rate, if beef ſells well in the ſpring, ſome advantage may be had, but gain cannot be depended on by ſuch practice.—How comes it then, ſaid I, to paſs, that heifer-beef is ſo frequently to be had in the ſpring? Becauſe, ſaid he, we graziers have ſometimes the miſchance to have a heifer warp, that would otherwiſe have been beef at Chriſtmaſs, but caſting her calf put her at leaſt ten weeks backward, and, to make the beſt of her, we muſt keep her on to fatting. Sometimes we are diſappointed by a heifer's or a cow's calving ſooner than we expected, perhaps in December or January, and thence ſhe would go dry; ſuch we muſt therefore fat, and, being fed with hay, ſhe makes early beef in the ſpring.

Allowance of hay to a fat beaſt on the road.

§. 20. Fourteen pound weight of hay is the conſtant allowance on the road, to every fat beaſt that is drove to London; they that entertain fat cattle fling fourteen pound of hay for each beaſt into the rack in the evening, when they come into the inn, which is to ſerve alſo next morning for their breakfaſt; ſo that half a tod, i. e. ſeven pound of hay, is ſuppoſed ſufficient for a fat ox's bait at night, and the ſame in the morning.

Of beaſts that are over-drove.

§. 21. The cattle, that in hot weather come to London in droves, are many of them heart-broken, and ſo heated, and tired off their ſpirits, that, if they were not killed, they would die; and thoſe whoſe feet bear not the journey well, do ſo waſte their juices through the fatigue, that, when they are killed, they will not ſtiffen.—The reaſon is, becauſe they have ſo emptied themſelves of their juices that their joints will remain looſe and flabby;—and thus we may obſerve, the plimming of meat in boiling argues the youth of it, i. e. it's fulneſs of juice, and it's ſhrinking argues the contrary.

Cattle handle beſt when warm, &c.

§. 22. Mr. Clerk, Sir Ambroſe Phillipps's tenant, ſays, when he drives cattle to Smithfield, if he has a chapman that is eager, as ſoon as his cattle take up their ſtand, if he can, he will deal with him; for cattle handle to the beſt advantage when warm, and their fat when heated is mellower, and ſofter than after they have ſtood to cool.

One may be more deceived in the condition of a fat beaſt in good quick-ſpringing graſs than in a coarſe paſture, becauſe the fine graſs may plim him faſter than it can make good ſound meat of his fleſh.

Of old cow-beef.

§. 23. An experienced butcher obſerved to me, that a young beaſt would eat well when half fat, but an old cow, and but half fat, was not eatable; for the whole body of ſuch a cow ought to be filled with new juices.

Old cow-beef generally comes in about St. Simon and Jude, which is the latter end of October, or later; for old cows are not apt to take bull ſo ſoon as young ones, and ſo do not make the earlieſt cow-beef.

Old cows tallow beſt on the inſide.

§. 24. The butcher killed a fat cow for me, of four years old; I ſaw her opened, and ſhe proved very fat withinſide, and very fat on the back.—He ſaid, it was common for a young cow to be fat on the back, but very rarely to tallow well in the inſide; but old cows generally tallowed beſt withinſide, but not ſo well on the back.

Sign of a cow's tallowing well.

§. 25. If a cow ſeeming high in caſe ſhould bring forth a ſmall calf, it argues, the cow thrives in tallow; and if a good cow, middling in caſe, produces a great calf, there cannot at that time be any foundation for tallow.

Old cows tallow beſt.

§. 26. I was at Gauſuns in Wiltſhire with farmer Pain and Mr. Biſſy: they agreed that an old cow, though ſhe would not weigh ſo well in the quarters as a young one, yet ſhe would tallow better.—But farmer Pain ſaid, to his certain knowledge, an old ewe would not do ſo; what tallow an old weather might yield he knew not.—However he was ſure, that the beſt mutton, and that for which the butcher would give me moſt, was a ſheep of two year, or two year and a half old; ſuch mutton would ſpend and weigh beſt. I objected, that ſuch ſheep, not having done growing, would not be fat. He ſaid, he never found it ſo: he bade me look at the ewes with their lambs, that he then had with him; the ewes are but two year old, and I hope, ſaid he, to have them all with the butcher in a little time.

Marks of a good bullock for fatting.

§. 27. In diſcourſe with farmer William Sartain of Wiltſhire about the choice of a bullock for fatting, and when his bones lay well, he ſaid, an underſtanding butcher might get more money by an ugly miſhapen bullock than one whoſe bones lay well, becauſe thoſe bones that lie ill, carry more fat than they ſeem to do; therefore, if a bullock handles well in the places they make trial of, that is only to be regarded.

Sign of a cow's tallowing well.

§. 28. If a cow carries a deep navel, or her navel ſprings or ſtruts forth when ſhe is fat, it is a very good, and almoſt a certain ſign that ſhe will die well, that is, that ſhe is full of tallow.

Id. of an ox.

If an ox be full at the cod, when bought lean, or ſprings and ſtruts forth full in the cod, when fat, it is a good ſign that he will tallow well.

Marks of a good ox—among the antients.

§. 29. [a] Varro, Columella, and Palladius are, in the main, pretty well agreed in the characters they have given us of a fine ox, which are as follow—Symmetry of parts; ſtout ſound limbs; a body large and ſomewhat long (cloſe and ſhort, ſays Columella) and well ribbed; horns bending a little inward like a creſcent, ſtately, ſtrong, and in colour inclining to black; a broad curled forehead; large black eyes; great hairy ears (or, as Markham tranſlates it, rough within); flat cheeks; ſpreading noſtrils; ſnub noſe; blackiſh lips; neck thick, long, and muſcular, with vaſt dewlaps, ſwagging down almoſt to the knees; deep briſket; buttocks round and full; ſides and paunch ſtrutting and capacious; a ſtrait flat back, or a little ſwayed; a tail bruſhing his heels, the lower part of it thick with hair, and a little frizzled; nervous and well ſet his legs, and rather ſhort than long; his knees ſtrait, ſomewhat knotted, or emboſſed, and ſtanding wide from each other; a foot not very broad, the claws large and of an equal ſize, not ſtradling apart, nor liable to accidents by inclining inward; his hide ſmooth and ſleek to the touch, it's colour black, as the moſt eligible, becauſe it denotes the beaſt to be of the hardieſt kind, next to that red, then fleſh-colour, and laſtly white, which is the tendereſt of the four. The colours Columella and Palladius moſt approve of are red and brown.

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[a] Hæ pecudes ſint bene compoſitæ, integris membris (grandibus, Colum.) oblongæ, amplæ, (corpore denſo brevique, Colum.) nigrantibus cornibus (proceris et robuſtis, Colum. ſine curvaturæ pravitate lunatis, Pallad) latis frontibus (et criſpis, Colum) oculis magnis et nigris, piloſis auribus (hirtis, Colum. magnis, Pallad.) compreſſis malis, ſubſimiſve, apertis naribus, labris ſubnigris, cervicibus craſſis, et longis, (et toroſis, Colum.) a collo palearibus demiſſis (amplis, et pene ad genua, Colum.) latis humeris (vaſtis, pectore magno, Colum.) bonis clunibus (rotundis, Colum.) (capaci et tanquam implente utero, lateribus porrectis, dorſo recto planoque, vel etiam ſubſidente, Colum.) caudam ut habeant profuſam uſque ad calces, inferiorem partem frequentibus pilis ſubcriſpam, cruribus (nervoſis, Pallad. brevioribus potius quam longis, Colum.) rectis genibus, eminulis, diſtantibus inter ſe, pedibus non latis (ungulis magnis, Colum. et Pallad.) neque ingredientibus qui diſplodantur, nec cujus ungulæ divaricent, et cujus ungues ſint pares,—et leves, ſays Varro, but that term muſt rather refer to the cow than the ox.—Corium attactu non aſperum et durum, colore potiſſimum nigro, dein rubeo, tertio helvo, quarto albo; molliſſimus enim hic, ut duriſſimus primus.

Id. for fatting among the moderns.

A beaſt ſhould have a large hoof or foot, and large long legs: this is a ſign, that, when he is fat, he will weigh well. A ſpiny legged beaſt never pays the grazier ſo well as the former.

A beaſt ſhould not be leather-throated, that is, have his ſkin hang down deep under his throat; but ſhould have a thin neck: the former is obſerved never to prove ſo well.

A beaſt ſhould be deep in his gaſcoigns, which mounts him high in the hinder parts, and makes him weigh well.

A beaſt ſhould be wide between both huckle bones, which gives room for his filling: ſuch a beaſt, when fat, will be ſure to weigh well.

A beaſt ſhould be deep in the briſket, that is, from the upper part of the ſhoulder to the lower part of the neck; for then he will fill well with fat.

A beaſt ſhould be ſhort ribbed, that is, the rib and the flank ſhould meet cloſe: ſome beaſts either want a rib, or have a falſe rib, which is ſo called, becauſe it is very little, or lies deep within; this is a great diſſight, by which means the flank will pitch and fall in.

When a beaſt is fat, he will ſhew himſelf to the eye to be ſo by a roll of fat as big as one's fiſt, which, when he walks, moves itſelf forwards before his ſhoulder: ſuch a roll of fat may likewiſe be ſeen in his flank. Luxuriat toris, ſays Virgil.

Sign of a good cow. See Bulls and Cows, §. 1. &c.

§. 30. A cow has a good udder, when her teats are at equal diſtance, and pretty wide aſunder; when the teats are near together, there is danger of loſing one of them; as her teats ought not to be very ſmall, ſo neither ought they to be too big; for ſuch are called windy teats.—When a cow's udder hangs full in leather, and in wrinkles behind, it is an argument the veſſel is large to receive milk, whereas ſome cows, tho' they might give ever ſo much milk, have no veſſel for it.

Mr. Clerk of Leiceſterſhire ſays, after all that has been ſaid, if he can buy a cow cheap, he will buy her againſt the rules of ſhape above deſcribed, and ſhe may ſometimes pay as well as any.

Signs of a good beaſt.

§. 31. Being at Holt in Wilts, I fell into diſcourſe with Mr. Biſſy, and having a mind to be more particularly informed in this branch of the grazier's buſineſs, I aſked him what were the ſigns and tokens of a good beaſt; thoſe by which he choſe them when he went to fairs; for he had juſt been ſaying, that there were many beaſts in a fair, which were in ſhow twenty ſhillings better than ſome others, and yet not ſo valuable as thoſe that ſeemed to be ſo much leſs worth: nay, he ſaid, there were many fat beaſts in Smithfield-market, twenty ſhillings more in weight than ſome others, and of the ſame age too, and the lighter beaſt the more preferable at the ſame price.—He therefore ſaid, that, in an ox the experienced graziers had a particular regard not to buy one that had a long and heavy dewlap, or merry-thought, which hung down under his throat, nor one that had a thick jaw, nor heavy ſmall eyes, nor that was thin in the buttocks: they commonly obſerved, he ſaid, that thoſe beaſts, which had moſt of theſe properties, paid leaſt for their fatting, nor did they take it kindly; for they were apt not to take fat in all parts proportionably alike.—We love to chooſe thoſe beaſts which have not too thick a hide, but of a middling thickneſs; for the grain of the beef of a thick-hided ox is apt to be coarſe, and yet we do not covet a very thin hide neither.—The north-country oxen, ſaid he, are generally thick-hided, nor will they in Smithfield ſell ſo dear as North-Wiltſhire oxen will do: the ſweetneſs of our beef is eſteemed greater than their's, and we can out-ſell them one hundred weight in ſeven.——We chooſe an ox with a light head, thin and cloſe jaws, full and lively eyes, not thin on the rump, but that has a thin and ſhort dewlap, and as little under the throat as may be; ſuch an ox is likely to thrive much faſter than one of the contrary ſhape, and to carry fat in all pieces equally, which is a great advantage to the butcher; for then, the coarſe pieces will ſell well. A light bony head in a ſheep is alſo a good ſign, but in a cow a long and heavy dewlap is not ſo much regarded.—Then I went with him down to his grounds, and was ſhewed two oxen which anſwered the above differences and characters.—Taking notice of a particular ox, he ſaid, that he was half fat, and began to gather fleſh, which might be as ſoon perceived in the cod as any where; for there they ſoon begin to ſhew their thriving, and ſo does a weather-ſheep.——I obſerved myſelf the cod to be truſs, and extended round as big as my fiſt; whereas, in the lean oxen in the field, the cod was lank, and made little ſhew.—He ſays, all fat beaſts are apt to be too hot; therefore a fatting-bullock, if he be kept out of the wet, cannot be kept too cool, and for that reaſon it does very well for one ſide of the fatting-houſes to be open; for, if a fatting-bullock be too hot, he will be apt to * peal: but for lean beaſts, they could not be kept too warm.

* the hair will come off.

Alſo of a worked and unworked ox.

§. 32. I find by Mr. Alyff of Oxenleaze, Wilts, that the largeneſs of the cod of a fat ox is a great beauty, and the bigger it is, proportionably a ſign of his fatting the better; and he is very poſitive in it, that oxen that work make the beſt beef, and die kindlier, and are inwardly fatter than thoſe that never worked, and ſays, (it being a phraſe he often uſed) that they divide better in the joints, and piece better under the cleaver, when quartered-out by the butcher; whereas the unworked-beef does not ſo eaſily divide, and (as he terms it) eats coarſe and livery.—I told him, I had often heard the graziers affirm as much, but it did not ſeem reaſonable to me, becauſe, as country-farmers and labourers had much greater ſtrength than gentlemen of the ſame bulk, by means of the exerciſe of all the ligatures and cords of their bodies, which became thereby ſtronger and tougher, ſo I thought that muſt be the caſe of the ploughed-ox; and ſeeing their fleſh and ours is but a bundle of pipes, tubes, or fiſtular parts faggotted together, full of heterogeneous juices, I could not conſequently ſuppoſe, but the fleſh of a worked-ox muſt be tougher than the fleſh of an unworked ox.

Marks of a beaſt when fat, or for fatting.

§. 33. Markham, lib. 1. fol. 62.—for an ox to feed, adviſes, that he ſhould as much as might be, be ever luſty and young of years, or, if old, yet healthful and unbruiſed, which you may know by a good tail, and a good piſſel; for, if the hair of one or both be loſt, he is then a waſter, and will be long in feeding. If you would chooſe a fat beaſt, handle his hindmoſt rib, and, if it be looſe, and ſoft, like down, then it ſhews the ox to be outwardly well fed; ſo do ſoft huckle-bones and a big notch round and knotty; if his cod be big and full, it ſhews he is well tallowed, and ſo doth the crop behind the ſhoulders.

Mr. Serjeant Webb's bailiff came to me in the beginning of November, 1713, to buy my lean oxen, that I wanted to caſt off to the grazier. He found fault with ſome that their bones did not lie right in two reſpects, viz. that they were thin in their buttocks behind, i. e. that their buttock, or britch-bone did not ſpread, and ſtand out wide; from whence, he ſaid, they would not prove, nor fill up in their buttocks behind, ſo as to look well to the grazier.

Again, there were two of them that had a rib wanting on each ſide, or a rib leſs in the flank than they ſhould have, viz. the firſt rib next to the buttock: note, though this defect commonly goes, and is known by the expreſſion of a rib wanting, yet a juſter expreſſion is, that ſuch a beaſt has a ſhort rib, which ſinks or falls inward, and does not bear outward, as the reſt do, ſo that in the handling one cannot get to feel all of it, but the lower part ſeems loſt, and therefore it vulgarly carries the name of a loſt rib.

There was another bullock he excepted againſt, becauſe the bottom buſhy part of his tail was loſt, having but little hair on it, which was to him a token that he had been over-worked.

In two or three he diſliked their hair's ſtaring, or ſtanding on-end, on the ridge of their back, another argument of their hard labour.

I aſked Mr. Dark, a great grazier in Wiltſhire, what marks he looked on as promiſing in beaſts to be bought for fatting; he ſaid, a beaſt with thick horns was by no means liked by graziers: and a thick head was an ill mark amongſt them; a beaſt with large ribs weighed well; a cloſe-ribbed beaſt, with quarters that lay well, they liked to buy, and not a thin flat-ribbed beaſt.

A thick hide a bad ſign.

§. 34. A butcher bought a heifer half fat of me to kill: he ſaid, ſhe would not pay for keeping, for ſhe was thick-hided, and ſuch beaſts would not prove.—I obſerved the hide ſeemed to ſit looſe, and the hair to ſtare more than ordinary, or look like beggars-pluſh.

Upon the beſt inquiry I could make of Mr. Biſſy, farmer William Sartain, and others in Wiltſhire, they do not think the Welch-cattle of North-Wales and the cattle of Shropſhire fat kindly; for they are thick-hided, eſpecially the burs, i.e. the oxen;--and it is to be noted, that the thicker hided the cattle are the longer they are in fatting.--And it is generally to be obſerved, that the cattle of North-Wales are black cattle.——But Mr. Biſſy ſays, that in South-Wales, as in Glamorganſhire, they have thin-hided cattle, which are much on the red and brown colour, and that they get their breed from Glouceſterſhire; they will ſat very kindly.—Mr. Biſſy tells me, the more northerly the cattle are bred, by means of the cold, the thicker are their hides; for in Leiceſterſhire, Derbyſhire, and Yorkſhire, the hide of a large ox may ſell for thirty ſhillings, becauſe of it's thickneſs, and being fit to make ben-leather for the ſoles of ſhoes; whereas the hide of an ox in North-Wiltſhire, &c. though as big as the other, will not fetch above fifteen ſhillings; but ſuch an ox will notwithſtanding ſell for more than a north-country ox will do, becauſe the meat is finer, and the beaſt will yield more tallow; for the finer the hide the finer always the meat.—I put the queſtion to farmer William Sartain, young John Sartain, &c.—what difference there might be in Smithfield-market between the price of a north-country ox, and a North-Wiltſhire ox of the ſame weight; they ſaid two pounds in ten pounds, but the hide of the north-country ox would yield a third penny more in value.

Rules for the hill-country grazier.

§. 35. If a farmer intends to graze cattle in a hill-country farm, ſuch as mine in Hampſhire may be, theſe three things are eſpecially to be regarded; Firſt, to raiſe a good quantity of French-graſs for hay and aftermaſs.--Secondly, to turn a good quantity of hill-country meadow into rich paſture, by feeding it, dunging it, or other manure; to make it fit for raiſing the bullock or heifer in the ſpring, when he comes firſt from hay into graſs-leaſe, and to receive him with a vigorous aftermaſs, when other graſſes, as clovers, and French-graſs aftermaſs goes off.—Thirdly, to have hovels in your bartons, incloſed with cloſe court walls, to ſhelter your cattle in the winter from wind and rain. All theſe three things are neceſſary and uniform, and do correſpond one with another; without them grazing muſt be carried on very defectively, and to little profit by the hill-country farmer.

By the methods here preſcribed, in order to the fatting of cattle, plenty of French-graſs hay will enable the grazier to buy in barren beaſts before the ſpring-graſs comes, when it is moſt likely they will be cheap, and may be bought to the beſt advantage, allowing the value of the hay they may eat in conſideration with the purchaſe; and if by winter-hayning ſome meadow-ground, (after it has been fed cloſe, but has been kept high in heart, by feeding it, and ſoiling it,) you can early in the ſpring, by April or ſooner, have a bite to take off ſuch grazing beaſts from hay to graſs, it will be very advantageous before the clovers can be ready, which are ſeldom ſo in the hill-country till a week or fortnight within May;--and by hayning-up ſuch meads for an aftermaſs, which towards the end of the ſummer are in very good heart, you'll ſupport your bullock, and carry him on when the ſpirit of the other graſſes fail.—Then ſuch cattle as are unfiniſhed being brought to French-graſs hay, and tied up under hovels, or coverings, and within court walls, will proceed in thriving by being ſecured from the wind and rain, and the tedious hill-country rimes, that often continue whole winter-days, all which makes fatting-cattle brought from graſs to pitch, and waſhes them out.—Beſides, if you have not plenty of French-graſs hay, you cannot in winter make the beſt of a milch-cow that warps, or of a cow that towards the latter end of winter you may perceive proves barren, or of a fat cow that caſts her calf before you kill her.—I mention here the neceſſity of French-graſs hay only, and not of clover hay, becauſe I ſuppoſe the hill-country farmer, who provides ſtore of French-graſs hay, will be wiſe enough not to mow the clovers, but to feed them, to improve his lands, for the hill-country farmers have generally ſo much land for their money, that all they can do is little enough to keep their arable land in ſuch heart, as for their profit it ought to be in.

If the foregoing cautions are not obſerved, the ill conſequences that will follow muſt be ſuch as theſe;—if the firſt of the three foregoing cautions is diſregarded, your cattle cannot at any time of the year be made fat as they ought to be, and then you muſt be under neceſſity of ſelling them half fat, of which neceſſity the buyer never fails to take the advantage; and ſell them you muſt, notwithſtanding the proſpect of prices riſing in a month or two never ſo much; and you'll commonly find, that you ſhall have nothing for the meat they have eat whilſt they have been fatting.—In the ſecond place, we will ſuppoſe that very few will be ſo unwiſe, as to begin to fat a beaſt in October with hay, and ſo to hay him throughout the winter; but we may reaſonably ſuppoſe, that warping beaſts and barren heifers, &c. may, and commonly are begun to be fatted with hay from Chriſtmaſs, in which caſe, though hay be plenty, yet if an early ſpring-graſs be wanting, ſuch cattle muſt be hayed at leaſt till the middle of May; for till then, in the hill-country, the clovers will not give a beaſt a bite, and then commonly, where the maſter is at a loſs and diſappointed, the goods ſuffer before his eyes before he can make the beſt of them, and in this caſe he ſhall find a beaſt viſibly pitch before he can find a purchaſer for him.—Again, if early ſpring-graſs be wanting, you cannot begin ſummer-fatting of cattle, nor can buy a barren heifer till towards the middle of May, and then they are commonly very dear; and in the hill-country from ſo late a beginning the ſummer-graſs will hardly fat a beaſt, the ground falling early off it's ſtrength, being generally poor;—and then, if you have not a quick-growing aftermaſs treaſured up, by keeping ſuch ground as was formerly meadow in good heart for that purpoſe, it is plain you muſt again run into the firſt evil;—and if you have ſuch an aftermaſs, you will again often be wanting hay in November, and December, to finiſh ſummer-fatted beaſts; ſo that plenty of hay is always neceſſary, &c.—And laſtly, though you have both hay and graſs, if you want winter ſhelter the cattle muſt ſuffer.

PROPOSALS for FATTING CATTLE in the hill-country, and firſt of the BARREN HEIFER.

§. 36. It is propoſed (1.) That the meadows of the farm, which generally in a farm of an hundred pounds per annum hold to no greater proportion than from twelve to twenty acres, be laid to paſture for the fatting purpoſe.

(2.) That from ſeven to ten acres be yearly ſowed to hop-clover, for the firſt ſpring-graſs for the fatting of beaſts.

(3.) That the good paſture you have made of ground beſt inclined to natural graſs, by chalking and dunging, &c. may receive the barren heifers, (for I fear it will not be good enough, nor deep enough fed for the oxen) and this made paſture, having been hayned from the latter end of January, or the middle of

February, I ſuppoſe may by the end of April have got a good head of graſs.

(4.) Your barren heifers muſt, from the time they may have been ſuppoſed to have eaten up this made paſture, be kept in your meadows till they come to the ſlaughter.

All fatting-cattle, whether lambs, ſheep, barren cows, or oxen, do require a regular and proportionable progreſſion from coarſer to better food, as they grow more and more into good fleſh; otherwiſe, when half fat, they will go back, and you will not without great difficulty raiſe them again, which will be a great loſs, nor will ſuch beef ſpend kindly.

Againſt the time he buys in his heifers, a gentleman who would make a good hill-country grazier (for I do not ſuppoſe it to anſwer but to ſuch who kill their own beef in their family) ought to take care to be provided with an over-plus ſtock of middling good hay, or of winter-vetches, or of barley-ſtraw and autumn-graſs mixed together, layer and layer of each, be it whatever it will; it ought properly to be better than barley-ſtraw; for he is to ſuppoſe he has bought barren heifers which have been kept all winter to ſtraw;—if they have been kept better, i. e. to ſtraw and rowet, there is ſtill the greater reaſon for him to mend their keeping;—and he is from the time of buying to conſider, that he ought to begin to raiſe them in fleſh; for the better caſe they are in againſt they are turned to ſpring-graſs, they will take to fatting the kindlier, and bear their firſt ſcouring the better.—If he could turn them into a field, for an hour or two in the day, where there is a little rowet, it would do well, and to have change of the aboveſaid dry meats would keep them the better to their ſtomachs.

PROPOSALS for FATTING OXEN, in the hill-country.

§. 37. The times of turning off oxen to fatting are two in the year, which in ſeveral reſpects anſwer the publick conveniency, viz.

(1.) The firſt is about May-day, when the labour of the ox is pretty well over for the ſpring-ſeaſon, the ſpring-corn being then generally all ſown.

(2.) The ſecond time for turning oxen to fatting is the beginning of winter, i. e. from the firſt of October to the middle of November, which falls out again very luckily; for then the winter-corn, i. e. wheat, and winter-vetches are generally all ſowed throughout England, and the plough-man's hurry relaxes.

At both theſe times the grazing gentleman, who deſigns to kill for his table all the year round, muſt turn oxen to fatting.——We will firſt begin to diſcourſe of the ſpring-fatting, which is the moſt chargeable to the huſbandman, and therefore he ought to expect a better price, and a ſuitable return; for oxen turned out at May-day will hardly get fat till Chriſtmaſs, and, if not turned out till June, will not be fat till March, April, or May, which again falls out very opportunely; becauſe from Chriſtmaſs till the latter end of May cow-beef is very ſcarce, and is generally ſupplied by ox-beef; but then it is obvious, that when an ox gets half, or three quarters fat by or befor winter, he muſt be ſupported and carried on by a great quantity of hay, and that very good; for the beaſt will then grow nice.

The other time of entering an ox into fatting is, as beforeſaid, in October and November, when he is alſo turned off from the plough; and the gentleman, my young huſbandman, muſt be informed, that it is waſte to lay very good, much more the beſt of hay before ſuch an ox; for coming hungry and poor to it, he will devour abundance, and will eat up the fatteſt hay without paying for the coſt and charges of it.—The moſt you can propoſe by this method is to get him fat by July, inſtead of September, or October; during all which interval of time heifer-beef will be plenty, and will ſink the price of ox-beef; therefore ſo chargeable a method will not quit coſts.

What the grazier therefore in this caſe ought to do, is as follows: he ſhould bring his ox eaſily and gently into good fleſh by a rowet, that he ought to have hayned his grounds up to for that purpoſe, and of which rowet he ought to give him the worſt firſt, except it be of ſo ſour a kind as to want the correction of the winter-froſts before he will eat it, of which kind ſtubble-rowet commonly is, and in ſuch caſe that muſt be reſerved till then, or rather for young beaſts, and milch-cow cattle.—He ought to give him variety of dry meat along with his rowet, in which he ought to conſult his tooth by flinging before him, by changes, each ſort of good ſtraw, giving now and then a lock of winter-vetches, or coarſer hay, but of every thing good in it's kind, i. e. ſweet, and well made, and thus the ox ought to be carried on throughout the winter.—Againſt March comes he ought to have better hay; not only becauſe the rowet may be ſuppoſed to be all gone, but alſo becauſe the ox mending in fleſh grows nicer, and will be weary of dry meat, through the tediouſneſs of being foddered ſo much with it during the winter; therefore his hay muſt be mended; for not proceeding is going back.—Againſt April, if poſſible, a ſhort head of graſs ſhould be got for him in your paſture-ground for cow-cattle, by hayning the paſture in February, that he may have graſs along with his hay, as before ſaid in the fatting of barren heifers;—and againſt May a head of hop-clover muſt be in readineſs, in the hill-country, to receive him into his firſt full grazing, as is alſo ſaid of fatting the barren heifer; for it is not to be ſuppoſed the meadows of the hill-country, which according to this ſcheme are to be converted to paſture, can be fit before the firſt of June to entertain a grazing-ox; and it is alſo to be noted, that in the hill-country, in the month of May, hop-clover will not afford a good bite for an ox, or a cow, unleſs the autumn-bud be hayned, and preſerved from being fed by ſheep: in the month of May, if it ſhould prove a cold and dry ſpring, the fatting-oxen and cows muſt alſo with their hop-clover, if it be ſhort, have good hay given them, if they will eat it.—Note, fatting in the hill-country, if you hay in the winter, is more chargeable than in the vale, not only becauſe hay is dearer there, but alſo becauſe the winter-ſeaſon begins a month ſooner, and holds a month later in the hill-country than in the vale.

Thus you ſee what diſadvantages the hill-country gentleman lies under, who would kill a bullock once a month, or three weeks, more than a grazier of the vale does; for the firſt muſt, in a manner, by forcing nature provide rowet and ſeveral ſorts of graſſes in their due order, exactly accommodated to the ſeaſon of the year, beſides winter-meat, &c.—Whereas, for the latter all may be procured in a natural courſe, with but a very little care and trouble.

Now I doubt not but by this time the reader is provided with a fatal objection, and will tell me, I have forgot the taking care to provide one of the moſt material, and difficult ingredients to be had in the hill-country for fatting of cattle, viz. proper graſs, in a ſufficient plenty, and yet on all occaſions I have before preſcribed it.—I do acknowledge I ſhould make a very great, and ridiculous blunder, without an ample proviſion in this caſe; I muſt therefore lay it down as a principle, that a hill-country grazier goes to work without his tools, who does not lay down from fifty to an hundred acres of land proper for it to French-graſs, not only on the account of making up the deficiency of the meadows, not laid down to paſture, being converted to other uſes, but alſo to anſwer many other demands, for inſtructions in which matter, I refer to the chapter on French-graſſes, &c.[b]

TURNIPS.

Liming good for turnips.

§. 1.[c] OBſerving that the turnips, which one of my tenants was cutting, were wormy, I told him, they would have been leſs ſo, in caſe he had limed his ground.—He ſaid, that laſt year (1702) he limed one part of his ground, and thoſe turnips were much freer from worms than theſe;—and, ſaid I, much ſweeter too, I believed.—He anſwered, he never had ſweeter turnips, nor carrots than from that ground, and he did believe that liming was the occaſion of it.

Dunging turnips in Norfolk.

§. 2.[d] Mr. Heron of Norfolk aſſures me, that they dung their turnip-land as much as may be, even to that degree, that their dry land-meadows are quite impoveriſhed by it.

Rules for ſowing turnips.

§. 3. I had diſcourſe with Mr. Pawlet of Leiceſterſhire, who deals in great quantities of turnips; it was Auguſt the 7th, 1699—he ſays, when turnips are ſowed after Midſummer they are generally counted out of danger of the fly:—This fly is like to a weevil breeding in malt, with hard wings; there is no danger of it after the turnip-leaf begins to grow rough, which will be in a fortnight's time after ſowed, if they come up well. He ſows a pound and an half of ſeed on an acre, and ſo, as I find, do all the gardeners in thoſe parts; for the more are ſown on an acre the more chance they have to eſcape the flies.—[e] There are, he ſays, four ſorts of turnips; viz. the white turnips, the red or blue turnips, the yellow turnips, and the long turnips; for ſale the gardeners deal only in the firſt two ſorts;—that the fly lays more ſeverely on the leaves of the red or blue ſort than on the white; that turnips ſhould be ſowed in dry weather, or elſe they cannot be raked or harrowed-in well; that they muſt have a ſhower of rain to come up in; that though it is true the rain beats down and deſtroys the fly that would devour them, yet it makes thoſe flies that out-live it cruelly hungry; ſo that it is after ſuch rain that the turnip-leaves are moſt eaten. He ſays, there is ſo much moiſture in the ground before Michaelmaſs, that you never need to doubt the ſeed ſown in Auguſt or after.

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[b] See the articles—Bulls and Oxen—Cows and Calves.

[c] To deſtroy the caterpillar, Mr. Miller ſays the ſureſt method is, to turn a large parcel of poultry into the field; which ſhould be kept hungry, and turned early in the morning into the field: theſe fowls will ſoon devour the inſects, and clear the field.

[d] Dung and tillage together, ſays Mr. Tull, will attain the neceſſary degree of pulverization in leſs time than ploughing can do alone; therefore dung is more uſeful to turnips, becauſe they have commonly leſs time to grow than other plants.

§. 4. Mr. Scamwell aſſures me, if I ſtrew tobacco-duſt over the land where any greens, as lettuce, &c. are ſet (ſuppoſe a pound to an acre) the fly will not come to thoſe greens. Quære, if not a good way to ſow turnip-ſeed with tobacco-duſt.—I am told if you mix powder-brimſtone with your turnip-ſeed it will preſerve them from the fly.—Mr. Worlidge in his treatiſe, called Two treatiſes, ſays, that the greateſt enemies to turnips are the flies, which, about the ſowing-time, by the ſun's influence, are generated in the ſtubble that remained in the field, where you now ſow your ſeed; for it is obſerved, that an eaſy ploughing and ſudden ſowing theſe ſeeds makes the turnips more apt to be thus deſtroyed, than a well dreſſing, and more leiſurely ſowing; for this deprives theſe vermin of their ſhelter and ſuſtenance, ſo that they generally die before the ſeeds come up. The ſeed being ſoaked in ſoot-water, and ſowed, the bitterneſs they have attracted from the ſoot is ſaid to be a ſecurity againſt birds, flies, and inſects.—New burn-beaked ground ſowed with turnips has been obſerved to eſcape the fly more than other land, and ſome ſtrew aſhes on their turnips in gardens to preſerve them from this inſect.

Turnips to be ſowed early in a cold country.

§. 5. Mr. Bachelour told me, that I might depend on it, this was ſo cold a country, that, if I ſowed turnips the latter end of Auguſt, I ſhould not ſo much as have leaves, and therefore I ought to ſow them by Midſummer: he ſaid, he had known it tried.

Why turnips ſowed, when the wind is northerly, or in a hot gloom, may not come up.

§. 6. I told a famous gardener, that I had heard it ſaid, if turnips were ſowed when the wind was in the north, or north-eaſt, that no turnips would come up.—The cauſe of that, he ſaid, muſt chiefly be, becauſe ſuch wind, which naturally parched the ground and dried up all moiſture, was at that time accompanied with drought; but he doubted not, though turnips were ſown in ſuch wind, if rain came afterwards, they would come up well.—I have alſo heard, ſaid I, that if turnips were ſowed in rain, and a hot gloom came afterwards, that no turnips would come up.—He ſaid, the reaſon of that, he thought, muſt be, becauſe the ground, by ſuch a ſudden heat after wet, was made ſtarky, ſo that the turnips could not get through;

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[e] Mr. Miller adds two other ſorts, viz.—the ruſty-black, and the green turnip.

and may not, ſaid he, charlock, and other weeds be deſtroyed by the ſame accident?—And indeed I cannot but agree with him; for if it be obſerved, you will find the turnip does not come up with it's ſeed-leaves upright, picked, and ſharp, as many ſeeds do, but with broad indented ſeed-leaves, and the ſtem that carries it's head being but tender, no wonder if it cannot pierce through the cruſt of earth, when it is hardened.—Here the wiſdom of God is to be admired, who, having ordered ſeed-leaves not ſharp-pointed or ſpiked, but broad, or many, and indented, and ſo not fit to force upwards, has cauſed them to bend their heads downwards, and ſo to get through the earth by their bended ſtalk.

Caution—to preſerve the beſt ſeed.

§. 7. I am of opinion the way to have large turnips is to preſerve ſome of the largeſt turnips for ſeed; for from ſuch ſeed do the largeſt turnips proceed; whereas the ſeed bought of gardeners comes of their ſcattered ſeed, which, running up thick, does not head, nor produce a ſeed that will carry a large turnip.—It is the ſame of aſparagus, ſays Quinteny.

Quantity of ſeed on an acre.

§. 8. Mr. Cheſlin of Leiceſterſhire having been very ſucceſsful in turnips, I aſked him, whether he did not ſow about a pound and an half on an acre; he ſaid, his was cold land, for which reaſon he ſowed rather more.

Of turnip-ſeed burſting with too much rain.

§. 9. As the leſs ſolid the rinds of all ſeeds are the larger the fibres, and as the leſs ſpirit and oil is contained in them they do the leſs reſiſt vegetation, and conſequently putrefaction, and the ſooner begin growing, or are malted in the ground, ſo ſuch ſeeds may be expected, if they come not up in a few days (as turnip-ſeed in four or five days) to be either burſten with too much rain, or malted for want of moiſture, and conveniency to ſet them on growing; for ſuch ſeeds, of the nature above deſcribed, are ſuſceptible of a great deal of moiſture, and therefore, when ſown in the drieſt time, though they meet not with moiſture enough to ſet them on growing, ſeldom fail of being malted, becauſe the very relaxing quality which is in all earth, together with the dew of the night, are ſufficient for that purpoſe. Yet, as to the burſting the veſſels of the turnip-ſeed by plethory cauſed by too much rain, it may be noted, that ſome have obſerved a glut of rain to have fallen on the turnip-ſeed, ſoon after they have ſown it, without any ſuch ill effect, and others have found that ſuch ſpeedy rains have burſt the veſſels, and turned the flour of the ſeed into a mucilage.—In theſe two different caſes, as I judge, the following diſtinctions ſhould be made, viz. in caſe the turnip-ſeed be ſown for the ſake of roots in June or July, while the ground is hot with the ſun, and has at the time of ſuch heat been glutted with rain, or that a glut of rain immediately falls on ſuch ſowing the turnip-ſeed, i. e. the ſame day, or the night after it was ſown; in ſuch caſe I eaſily conceive, the turnip-ſeed being very ſuſceptible of moiſture, the ſeed-veſſels may imbibe the rain to ſo great a degree as to be diſtended thereby, and be burſten with the heat that rarifies ſuch moiſture;—but in caſe the ſeed be not ſown till about the middle or latter end of Auguſt, when it is ſown chiefly for the herbage, the ground being generally cooler, and not heated like a hot-bed to force up the ſeed ſo quickly, yet moiſt enough, when drieſt at that time of the year, to ſet the turnip-ſeed on growing without rain, in ſuch caſe, eſpecially if rain does not fall under two days after the turnips are ſown, it is probable the ſeed may have had ſo much time to ſwell gradually in the ground before the rain comes, that it may be paſt ſuch danger; and this is the beſt account I can give of the aforeſaid diverſity.

Id. and of other ſeeds.

As for the above reaſons turnip-ſeed is ſubject either to be malted, or to corrupt, it may not be improper to add here, that the ſame reaſons may hold for the ſame effect in many other ſeeds, as the medic-graſs, the vetch, &c.—which the Rei ruſticæ ſcriptores order to be ſoon covered, becauſe they are ſoon corrupted; for whether a haſty rain may come ſuddenly on them, as they lie above ground, before they can be harrowed-in, or they lie on the ground expoſed to the ſcorching ſun before they are covered, it ſeems in both caſes, for the ſame reaſon, they may either be malted by the ſcorching heat of the day, and the giving damps of the night, or, being firſt ſcalded by the ſun, and a ſudden rain coming on them whilſt above ground, they may imbibe the moiſture the faſter, and ſo burſt with a plethory, and this more likely than if they were firſt covered, or than after they have lain wet in the ground, becauſe, in the firſt caſe, the too much wet they receive as they lie above ground carrying not ſo much of the ſpirit, or vegetable juices, or volatile ſalts of the earth along with the water, the nib, or germen is not ſo much impregnated therewith, as to be puſhed forward into the act of vegetation, but the nib or plant of the ſeed is ſwelled, and drowned, and burſts in the veſſels by receiving too much water without a ſpirit ſufficient to actuate and protrude the vegetable parts, &c.—In the ſecond caſe, the ſeed lying on the ground, if the ſcorching ſun lies on it, it's veſſels, being thereby ſhrunk, do, on a haſty rain following, imbibe the moiſture to a greater degree than otherwiſe, and to a burſting;—and I muſt now acquaint the reader, it has not a little exerciſed my thoughts in the reflection what ſhould be the reaſon why hop-clover and broad-clover ſeed ſhould often come up ſo partially in the ſame field, where the nature of the earth has been the ſame, the ſeaſon the ſame, and the tillage the ſame; yet I have had ſome lands in the ſame field, and that more than once, where the clover has not come up at all, or but very ſparingly, when at the ſame time it has come up in another part of the ground very proſperouſly. I am not able to account for it otherwiſe than that I ſuſpect we have ſometimes ſowed ſome of the clover-ſeed, as is uſual, after the day's-work of harrowing has been over, in order to cut out work for the horſes the next day, and then rain has fallen in the night, or the next day, ſo as to hinder the harrowing the ſeed in for a day or two, or ſun-ſhiny, or windy weather has come, ſo as to dry the ſeed, and we have neglected to heal it with the harrows next day, other buſineſs intervening, and ſo the ſeed has periſhed. I muſt confeſs I cannot advance this beyond a probable hypotheſis for want of having kept a diary of the fact, therefore leave the reader to make the beſt he can of the hint I give.—[f] Pliny ſays, caution muſt be uſed in ſowing the medic-clover, which ought to be covered in as ſoon as ſowed, leſt it ſhould be burnt up.

Of ſowing turnips on a peas-erſh.

§. 10. Farmer Miles ſays, he has often known, where peas have proved rank, ſo as to have made the ground mellow, that turnips have been ſown thereon, as ſoon as the peas were removed, and harrowed-in without ploughing, and it has had very good ſucceſs.

Of turnip-feed lying a year in the ground.

§. 11. My gardener affirms, if turnip-ſeed be dropped, and in digging covered over with earth, he has the next year found ſuch ſeed freſh and good, and, when the earth was turned back again, it has grown, and produced good turnips.—I aſked him how that could be, ſince it is ſaid, if turnips be ſown, and no rain falls in ſome ſhort time, the ſeed will die and never come up.—He ſaid, that was true; for when it lies on the top of the earth, and but juſt harrowed-in, if nine or ten days hot weather come upon it, it will never come up, but in this it was turned a ſpade deep under ground.

The time of houghing turnips.

§. 12. The Newtown-men, who houghed my turnips this year (1707) having made it their buſineſs for many years to hough turnips, aſſure me, that it is beſt to hough turnips as ſoon as they have four leaves, that is, as they explain it, the two ſeed-leaves, and the two ſucceeding leaves, provided they are grown big enough to be out of danger of being buried in houghing.

Manner of houghing turnips.

§. 13. In houghing turnips I ſuppoſe care ought to be taken to hough thoſe up that are deepeſt rooted in the earth, and to leave thoſe that grow upon, and moſt out of the earth, without much regarding their bigneſs, inaſmuch as they that lie on the ground, and have room to grow, will quickly be the biggeſt turnips.

A dry ſeaſon beſt for houghing turnips.

§. 14. A dry ſeaſon is the beſt for houghing turnips, becauſe neither the weeds nor the turnips houghed up will be ſo apt to grow again.

Beſt way of managing turnip-ſeed.

§. 15. I am apt to think the beſt way to manage turnips (the ſeed of which is impatient of growth, and apt to burſt in too much wet, as alſo to corrupt, if the ground be ſo dry as only to give it a damp, but not wet enough to ſet it on growing) is, firſt to harrow the ground fine, then to roll it with a roller big enough to break the little clods, and ſo to let it lie till the next rain; then the ground being mellow, to ſow the ſeed, and harrow it in with ſhort-tined harrows, which may not open the ground too deep, nor bury the ſeed; then to roll it again with an one-horſe roller, in order to keep the moiſture in the ground as deep as the ſeed may lie; for the ſurface of the ground muſt not be dried before the ſeed can ſtrike root, which may be in two days and two nights, and yet the ſurface of the earth muſt be ſo fine, and ſo lightly compreſſed, that the ſeed may ſpear through.—The myſtery of the ſucceſs or miſcarriage of a crop of turnips conſiſts in theſe four things, viz. firſt in the ſeed's not lying too deep; ſecondly, in it's not lying too wet, which it cannot eaſily do if harrowed-in ſhallow, for the ſurface of the earth is ſoon dry; thirdly, in it's not lying too dry; and, fourthly, in it's lying in a fine bed.

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[f] De medica cavendum, ne aduratur, terrâque protinus integi debet. Plin. lib. 18. ſo. 288.

Id. in clay-land.

Turnips ought, in clay-land, to be but juſt harrowed-in with a buſh, as light as may be, that the turnip-root may grow upon the ground; for it will not be able to grow to it's dimenſions within the clay-ground, nor can it, if it be checked in it's growth by a ſtiff ground, be ſweet, becauſe, for want of room, the exuberancy of it's juice will make it knotty and ſticky.

I have often conſidered the nature of turnips, particularly with relation to the ſoil of our hill-country, and do think we are like to be deprived of that benefit others have from turnips, becauſe our ground is ſo cold and backward in it's productions, that we can never expect to ſow a crop of turnips after a crop of hotſpur-peas; for in the firſt place hotſpur peas will be late ripe with us, and, if we could rid that crop by the middle of June, yet that is too late to ſow turnips with us, on account of the drought that reigns over us at that time, nor would turnips have time enough, in ſo cold a country as our's is, to grow to perfection.—If we ſow in the beginning of May, the turnip will not ſeed with us the ſame ſummer; ſo that it is plain we cannot have two crops the ſame ſummer, but the crop of turnips, which is hazardous, muſt ſtand in the room of a crop of corn.—The beſt way I can propoſe for a crop of turnips in our country is, to winter-fallow the ſecond or third year's clover-ground, which will be rather too poor to bear a crop of barley without the ſoil of folding, and then to ſow turnips the beginning of May, and, if they ſucceed, you will have all the May-ſhowers to forward them, and time enough, if the firſt ſowing fails, to try again, and, if you ſhould not ſucceed at laſt, the ground will be very ſufficiently, and excellently huſbanded to plough again, and ſow winter-vetches in Auguſt: all things conſidered here is the leaſt loſt every way, as I could demonſtrate.

White-land better than clay for turnips, in regard to their ſweetneſs.

§. 16. With us at Crux-Eaſton, turnips will be ſweeter in white than in our clay-ground, as I have obſerved in a garden-plot with one part of it clay-land, and the other white down-land: always from the white-land there comes a very ſweet turnip, but from the clay-land a rank turnip that the people cannot eat;—I ſuppoſe, if a ground conſiſted of theſe two ſorts of land, the ſheep would lie on the turnips of the white-land.

White land bad for turnips. Alſo of rape-roots.

But notwithſtanding this, January 10th (anno 1698) going to Holt by Burbage I aſked a farmer whether white lightiſh land might not bear turnips, and he ſaid, by no means, it was the worſt ſort of land of all for them; the blackiſh ſandy earth, or rediſh ſandy earth were the beſt.—Another farmer I met with afterwards ſaid the ſame, and they agreed the beſt time for ſowing them was about St. James's-tide. [Note, if they are ſowed earlier in the ſummer, the ſun will ripen them, and bring them on ſo faſt that they will be apt to run to ſeed.] Charlock, rape, and turnip-ſeed are not eaſily diſtinguiſhable, and ſheep will eat of the rape-roots as well as of the turnip roots, and it is of the ſame nature, and the ſame ſort of land agrees with it; only the rape-root does not grow ſo large as the true turnip-root does; yet many farmers about Burbage buy of it to ſow.

Turnips, if not clean eaten, may take root again after ploughing.

§. 17 Mr. Cooper of Berkſhire ſowed four acres to turnips laſt ſummer (anno 1699) and ploughed them up at ſpring, and ſowed the ground to peas;

and the little dwarfiſh turnips that were left behind uneaten, notwithſtanding his ploughing them up, took root again, and were then in great quantities run to ſeed, and had much damaged his crop of peas; but the ſeed being dropped he intended, after the peas were off, to harrow them in.

Of the hanbery, a diſtemper among turnips.

§. 18. Being in company with Mr. Gouch, a Norfolk gentleman, we diſcourſed about the turnip-huſbandry of Norfolk: I could not find that they ſo much valued the harm the fly did to their turnips, while they were young and tender in the leaf, as they did a diſtemper or diſeaſe that fell on the roots of their turnips, which they called the hanbery, alluding it ſeems, as he ſaid, to the like diſtemper in a horſe's heel, which was a warty excreſcence, that would ſometimes grow to the bigneſs of one's fiſt, and that ſome years this diſtemper would take whole fields, and, after it began to grow in the turnips, they would never thrive.—No one, he ſaid, could ever find out the cauſe of this diſeaſe.—I told him, I thought it muſt proceed from the egg of a worm or fly that was laid in the turnip, in the place where it had been bit, and the little maggot lay in the hollow place, which, with it's tail continually working circularly, formed the juice of the turnip into a round excreſcence about itſelf, in which it continued growing, like that of the oak-apple[g].

GRASSES.

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[g] After blaming the practice of putting a flock of ſheep into a large ground of turnips without dividing it, by which they will deſtroy as many in a fortnight as would keep them a whole winter, Mr. Tull proceeds to give an account of the three manners of ſpending turnips with ſheep, which are common to thoſe drilled, and to thoſe ſown in the random way.

The firſt manner now in uſe is, to divide the ground of turnips by hurdles, giving them leave to come upon no more at a time than they can eat in one day, and ſo advance the hurdles farther into the ground daily, until all be ſpent; but we muſt obſerve, that they never eat them clean this way, but leave the bottoms and outſides of the turnips they have ſcooped in the ground. Theſe bottoms people pull up with iron crooks made for that purpoſe; but their cavities being tainted with urine, dung, and dirt from their feet, tho' the ſheep do eat ſome of the pieces, they waſte more, and many the crooks leave behind in the earth, and even what they do eat of this tainted food, cannot nouriſh them ſo well as that which is freſh and cleanly.

The ſecond manner is to move the hurdles every day, as in the firſt; but, that the ſheep may not tread upon the turnips, they pull them up firſt, and then advance the hurdles as far daily as the turnips are pulled up, and no farther: by this means there is not that waſte made as in the other way; the food is eaten freſh and clean, and the turnips are pulled up with leſs labour than their pieces can be.

The third manner is to pull them up, and to carry them into ſome other ground in a cart or waggon, and there ſpread them every day on a new place, where the ſheep will eat them up clean, both leaf and root. This is done, when there is land not far off, which has more need of dung than that where the turnips grow, which perhaps is alſo too wet for ſheep in the winter, and then the turnips will, by the too great moiſture and dirt of the ſoil, ſpoil the ſheep, and, in ſome ſoils, give them the rot; yet ſuch ground will bring forth more and larger turnips than dry land, and when they are carried off and eaten on ploughed ground in dry weather, and on green-ſword in wet weather, the ſheep will thrive much better; and that moiſt ſoil, not being trodden by the ſheep, will be in much the better order for a crop of corn; and generally, the expence of hurdles and removing them being ſaved, will more than countervail the labour of carrying off the turnips.—They muſt always be carried off the ground for cows and oxen, which will be fatted by them, and ſome hay in the winter.

GRASSES.

Graſſes indicate the nature and goodneſs of the ſoil.

§. 1. BY my own obſervation I am ſenſible, that, as the ſort of graſs every ground bears (which is beſt diſcovered by it's ear or panicle) is a certain indication of the nature of the ſoil, ſo by the thinneſs of the culm, which carries the ear or panicle, and the ſhortneſs of the ear or panicle compared to what you may obſerve it to be in other grounds, you may make a right eſtimate of the goodneſs or poverty of any ground carrying ſuch or ſuch a ſort of graſs; for the reaſon holds as well in this caſe as it does in corn; therefore it is very neceſſary for our huſbandman to underſtand the Engliſh paſture, and meadow-graſſes.

The cow-quake graſs.

§. 2. The cow-quake graſs, or gramen tremulum, though a very poor and ſlender graſs, is no indication of poor land where it grows; for Mr. Ray ſays, it is the moſt common graſs of any in all the paſture grounds throughout England, Hoc genus in paſcuis per totam Angliam vulgatiſſimum eſt: in omnibus quas unquam luſtravit Cluſius regionibus prata multis locis veſtit. Fo. 1274.

Small creeping graſs and ſmooth-creſted graſs.

§. 3. The gramen parvum repens purpureâ ſpicâ, or ſmall creeping graſs, is no indication of bad ground, though a very ſlender graſs: Ray ſays, vol. 2. fo. 1286. it is very common in paſtures.—It ſeems to have a great ſweetneſs in it.—The ſame may be ſaid of the gramen criſtatum, for that alſo abounds every where in our meadows and paſtures. It is in Engliſh called ſmooth-creſted graſs.

Perennial graſſes may endure the winter.

§. 4. As I conceive, it may be laid down for a general rule, that all ſuch plants as are perennial will bear ſowing as well at autumn, i. e. before winter, as at ſpring, provided they are ſowed early enough to take good root before winter, the difficulty lying here; for they are plants that will endure many winters; thus may you ſow rye-graſs, broad-clover, hop-clover, French-graſs, &c.

I happened to carry out in my dung ſome winnowings of clover-ſeed, and laid them on two ridges of land where I had ſowed wheat: the clover came up very thick at harveſt; but was not ſo rank as the barley-clover, it being kept down by the wheat.—It was a very wet, but not a hard froſty winter; but from hence I do infer, that clover-ſeed will endure the winter, nor will it ſeed the next ſummer, nor damage the wheat.

Of the gaping of the ſeed-veſſels.

§. 5. This day, being the 30th of May (anno 1707) walking in the fields at Mr. Raymond's I obſerved that the ſeed-veſſels, or cups of all the ſeveral ſorts of graſſes in the meadows, gape in their flowering-time, ſo that the little miſtreſs or plume (from whence the flower ariſes, which is the firſt principle of the ſeed, and no bigger than the point of a needle) may eaſily be conceived to be hurt by bad weather, ſuch as blights, mildews, rain, &c. I alſo obſerved the ſeed-veſſels of the barley to gape.

I impute the great quantity of graſſes this ſummer, 1705, to the advantage of the great drought the graſs-flowers had in flowering-time, the farinaceous or flowering ſeeds on the ſtamina not having been waſhed off by rain.

§. 6. Hop-clover and broad-clover graſſes ſeem to my eye, by their deeper colour the ſecond year than the firſt, not to be ſo ſweet a food then as in the firſt year, when they are brighter coloured.

Of the nature of hop and broad-clover.

§. 7. As broad-clover falls off of it's ſweetneſs after Midſummer (as elſewhere hinted) and will not then fat ewes and lambs, as natural graſs in a good paſture will do, ſo I doubt not but all graſſes do abate of their ſweetneſs and ſpirit at that time of the year.

Gràſſes abate of their ſweetneſ after Midſummer.

§. 8. Varro ſays the medic ſeed ought to be ſowed in the morning after the dew is off; and no more ought to be ſowed than can be covered-in by the harrows the ſame day; for, if not covered, the leaſt wet may deſtroy it.

Of the medic ſeed.

Poſt ſecundam diei horam vel tertiam ſpargendum eſt, cum jam omnis humor ſole ventove deterſus eſt, neque amplius projici debet quam quod eodem die poſſit operiri, nam, ſi non inceſſit, quantulocunque humore prius quam obruatur corrumpitur.—I believe this ſeed, as well as vetches, and other grain that come up in the ſhorter time, takes in moiſture very faſt, and is apt therefore, if not ſowed dry, to burſt and corrupt.[h]

§. 9. I have often ſuſpected, that the hop-clover and broad-clover we ſow was not of Engliſh extraction, becauſe it will not laſt above two years with us, if mowed, and but three years if we feed it as ſparingly as poſſible, and ſow it in the beſt land we have; therefore I thought theſe ſeeds might have been brought from Flanders, where, as natives, they might laſt many years;--but I am now (anno 1707) convinced from Mr. Ray, and from the nature of thoſe plants: Mr. Ray, in his Hiſtory of Plants, vol. 1. fo. 944, calls the broad-clover we ſow—the larger purple meadow trefoil;--and ſhews the manifeſt differences between it, and our red honeyſuckle, and ſays,--it grows in paſtures, but leſs frequent than the common purple trefoil, and is alſo ſown in fields as food for cattle, and by ſome called common clover-graſs: and the ſame author, in his Synopſis Stirpium Britannicarum, fo. 194, carries on the compariſon farther, and ſays, it is not ſo durable as the leſſer purple meadow trefoil, nor does it like that ſow itſelf.—And of the hop-trefoil, vol. 1. fo. 949, he makes but two ſorts, and

Hop and broad-clover not natives of England.

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[h] The medic or Luſerne ſo much extolled by antient writers had not been long introduced into England, and was very little known in the time of our author. Mr. Tull's deſcription of it is as follows. "It's leaves reſemble thoſe of trefoil: it bears a blue bloſſom very like to double violets, "leaving a pod like a ſcrew, which contains the ſeeds about the bigneſs of broad-clover, tho' longer "and more of the kidney ſhape. It's tap-root penetrates deeper into the earth than any other ve-"getable it produceth."---He is of opinion however, from ſome reaſons he there mentions, that there is no hope of making any improvement by planting it in England, in any manner practiſed by the antients or moderns, and relates the great expence and pains the Romans were at to raiſe it; but to thoſe, who are deſirous of making the experiment, he recommends his new Horſe-hoeing Huſbandry as the only method to obtain it. Mr. Miller calls it an extreme hardy plant, and is poſitive it will ſucceed well in England, but ſeems to agree with Mr. Tull, that it cannot be cultivated here to any good purpoſe by the old method of huſbandry; for the rules he lays down for it's culture are all according to Mr. Tull's manner, by the drill, and the hoe-plough. See his directions at large under the article---Medica.

ſays, the bigger, which is that we ſow, grows in the fields among the hedges, eſpecially in gravelly or ſandy ſoils.—I do indeed conceive, that none of theſe trefoils are long-lived, not only becauſe they have tap-roots poorly maintained by fibres (of which thoſe we ſow have fewer, and are leſs nouriſhed by the capillary roots than the others, they being pretty well matted) but alſo becauſe I find the white honeyſuckle, the purple, and the leſſer hop-clover to increaſe and decreaſe yearly in a manifeſt manner, according as you improve or impoveriſh your ground; if you improve it with manure or aſhes, you may raiſe great quantities of it, I judge, from the ſeed, but if you mow it, and with-hold your dung, it will die away in two or three years time.—The * white honeyſuckle, I think, ought chiefly to be managed by manures, where it likes a ground, becauſe it is ſweet food, and by it's trayling ſtalks takes root at the joints, and matts extreamly, and ſoon over-runs a ground, and is therefore, I believe, the longeſt liver.

* Dutch clover.

To ſow clover on ſtony land.

§. 10. The more ſtony your ground is the more reaſon to ſow clover, becauſe thereby the barley may be the better raked up; inaſmuch as either hop or broad-clover will bear-up the barley from the ſtones, but rye-graſs, it ſeems, is not ſerviceable on that account.

Broad-clover runs ſooner to graſs when fed than when mowed.

§. 11. I find that broad-clover, ſowed on ſtrong clay-land, which is apt to run to ſword, is not ſo apt to run to graſs, if mowed, as when fed; for when it is mowed, the clover-graſs runs ſo rank, that it ſhades and depreſſes the natural graſs, which it cannot do when fed; beſides, the feeding of cattle brings a ſoil to it, which encourages the natural graſs, but kills the broad-clover; for, where the cow-dung lies, the broad-clover will turn white and rot underneath it, and dunging of ſown-graſſes, ſuch as ſaint-foin, inſtead of enriching them, brings on the natural graſs.

Inquiry into the cauſe why broad-clover often fails.

§. 12. It ſeems to me a very great difficulty how to account for the growing or not growing of broad-clover, whether ſowed in the ſpring, or at autumn with a wheat-crop; for I have often obſerved ſome lands in the ſame ground to fail, where the nature of the ſoil has been the ſame.—On the utmoſt reflection I can make, I do conclude, that ſometimes, where fields are ſown with wheat and broad-clover, the clover has failed on account of the coldneſs and wetneſs of the ground, and I make the ſame judgment of broad or hop-clover ſowed with oats, eſpecially if ſown early in the ſpring, when, though the land may not be too cold, neither in it's own nature, nor through rain, &c. for oats, yet it may be ſo for clover-ſeed.—And though white-ground in it's own nature be dry and warm, yet it is hollow and light, and, being alſo poor, the cold of the ſpring often pierces it, and ſo in ſuch grounds the hop-clover as often dies as in cold clay-ground.—And it often happens, that three or four acres in a large ground may fail by being ſowed wetter than the reſt, by the falling of rain, which might put a ſtop to the ſowing of the oats for two or three days, and then you may be obliged to ſow again before the ground may be dry enough for the clover-ſeed, though it may do well enough for the oats.—Note therefore for the future to obſerve more critically whether this diverſity does not hold.—From hence ſeems to ariſe the cauſe, why broad-clover ſeldom ſucceeds ſo well with black oats as with white, becauſe they are ſowed early, and while the ground is cold, and therefore the more care ought to be taken.

Of feeding broad-clover.

§. 13. The autumn-clover, which ſhoots up at the beginning of September, ariſing from a young bud, and being full of ſap as well as of but a ſhort length, is eaſily fed and maintained throughout the winter, and therefore to be ſaved by being hayned; but the firſt year's clover, which comes up among the corn, or the growth of aftermaſs-clover, being before autumn grown to a good length, requires too much nouriſhment (when nature is withdrawing it's ſtrength in order to form and nouriſh the buds of the next ſpring) to be maintained during the winter, and therefore ought to be fed down, becauſe otherwiſe it would die on the ground.

Caution to favour graſs after britting. See § 22.

§. 14. I left a patch of French-graſs for ſeed, and it britted much; I ſoon eat down the aftermaſs, and hayned it from the middle of Auguſt, or the beginning of September, for the next ſummer's crop: the 2d of October (anno 1704) I went to ſee whether the brittings came up, or not; I found they came up very thick on the ground, with their ſeed-leaves, and eſtabliſhed trefoil-leaves, and with farther ſoboles prepared at the roots for next year, and I believed they would do well, not having been fed otherwiſe than as above; for this feeding of the aftermaſs, to eat down the rowet, that the brittings might grow, did them good. A day or two after I obſerved broad-clover and hop-clover in their ſeed-leaves, and their trefoil-leaves, very plentiful from brittings; therefore the favouring ſuch grounds a month after britting, and in rains, adviſeable.

Firſt year's clover makes the beſt early graſs for horſes.

§. 15. Broad-clover of the firſt year, i. e. after the ſtubble, is forwarder in it's growth, and ſprings faſter than the ſecond year's growth will do; therefore, if you would have early graſs for your horſes, a cloſe of the firſt year's growth is fitteſt for them.—The fibres of the roots of the young clover are more ſpungy than thoſe of the ſecond year's growth; the glands alſo of the former are tenderer, and more eaſily admit of the philtration of the juices through them than the latter do, and therefore the young bud ſprouts faſter than that of the next year's growth.

Of broad-clover of the ſecond year's growth for fatting cattle in the ſpring. Vid. Fatting of cattle, § 17.

§. 16. Having ſaid ſomething of the great ſervice of twenty or thirty acres of broad-clover to ſupport great cattle in a dry ſeaſon, in July and Auguſt, when there is more eſpecially a ſtop to vegetation for a month or five weeks, I have this ſpring (anno 1719) found ſuch twenty or thirty acres of broad-clover, of the ſecond year's growth, of equal ſervice to what it had been in July and Auguſt; for this year my broad-clover ſupported my great cattle from the middle of April to the middle of May.—As I found the broad-clover of the ſaid grounds beneficial the former year in July and Auguſt, ſo without the ſame relief this ſpring my great cattle muſt have ſtarved; for my fodder-ſtraw was gone by the middle of April, and no rain had fallen for five weeks before, and the wind had been north and eaſterly for ſix weeks, ſo that no graſs of any other kind did wag, and yet the twenty acres of broad-clover did from Mid-April to Mid-May maintain twenty-three yearlings, and eight ſteers of four years growth, beſides a great many hogs, and yet the paſture grew on them, and run more and more to a head every day, though early in the ſpring the ſheep had fed it down bare, ſo that the ground was not hayned till the beginning of April, and the wind, as well as drought, oppoſed the growth of the graſs.

Of broad-clover, it's uſe.

§. 17. Amongſt the many advantages of ſowing broad-clover one is, that it will grow during the fore-part of the winter, and will ſupport a few fatting-ſheep, giving them a little hay with it, and without the graſs being injured by them, provided you keep only a few in a large extent of ground, that they may not be forced to bite too cloſe; whereas hop-clover will make no ſuch advances in the winter months as to ſerve ſuch an end or purpoſe: this is a good conveniency to a country gentleman, who would fat his own mutton in the winter.

Broad-clover loves moiſt ground.

§. 18. As I remember, Ray ſays, that the true broad-clover grows wild in moiſt fat meadows; therefore it is no wonder that it ſhould ſucceed well when ſowed in moiſt, ſpewy, and ſpringy cold arable.—At Holt there is ſo cold and ſpringy a clay, that the farmers uſed not to ſow it, either to barley, oats, or peas, and would but now and then clap in a few beans; but farmer Iſles (before, or about the year 1716) ſowed it to broad-clover, and it got a very thick ſwarth, and carried a deep green colour, and yet the ground was not laid round, but was laid down flat.

Id. black, ſandy, mellow land.

Farmer Lavington of Wiltſhire was of opinion, that a black, ſandy, mellow land was the beſt ground for broad-clover, and that the old broad-clover hay was as good as old meadow hay, only in foddering the leaves of the clover were apt to fall off, and ſo it made more waſte than the other.—Mr. Raymond ſaid, the broad-clover hay was ſo luſcious, that neither ſheep nor cows liked it ſo well as common meadow hay;—but farmer Lavington replied, he found not but that with change they liked it as well as the beſt hay.

Of clover in dry ſprings.

§. 19. It often happens, that, when dry ſprings and ſummers follow after the ſowing of clover-graſſes, they will come up in a blade, and die away again without any ſign of a blade appearing at harveſt, and yet about that time on the following ſummer a thick blade ſhall appear above ground, and produce a good crop: this happens when the blade only was killed by the drought; but the root had eſcaped, and ſo ſprung up again when rain came.—When the blade appears in the ſpring, tho' it dies away again, you may have hopes of it's reviving, but, if it never appeared, there can be no hopes at all.

Sickly clover ſhould be fed, healthy mowed.

§. 20. A Glouceſterſhire gentleman ſhewed me his broad-clover, and ſaid, ſome part of it had been dunged, and was the better for it;—but, when I had examined it, I found the land to be of a wet, cold nature, and I ſuſpected that moſt part of that which was not dunged was killed by the wet, and I believed much of the other was killed by the dung; but it is true, ſo much of it as eſcaped grew the thicker and ranker for it, being ſupported by the dung, as by a cordial, againſt the wet. This broad-clover turned yellow; therefore, if it did not recover it's colour, eſpecially if it put forth freſh buds at the root, I thought he ſhould feed it down, though if it recovered of it's ſickly look, it ought to be mowed.

Cows dunging kills broad-clover.

§. 21. I have heard ſay, that broad-clover would not come again where the cows had dunged, and I do believe it, eſpecially where it falls broad on the graſs; for I have turned up ſuch cow-dung, and found the broad-clover under it perfectly whitened, and rotted by the dung, which roots I ſuppoſe were forced by the dung in ſuch a manner as thereby to be killed, as it fares with kitchen-plants.

Of favouring broad-clover and French-graſs in November, &c. See §. 14.

§. 22. November the 5th (anno 1703) I cut up ſeveral roots of broad-clover, and found the top of the root divide itſelf into many tufts, as the French-graſs root does, through the center of which tufts the new ſoboles are formed, and iſſue out; I found at this time of the year moſt of the ſoboles formed for the next year grown enough to be bit off by the ſheep, which I conclude muſt put nature very backward, and cauſe her to form another centrical bud within the foldings of that bit off; therefore great favour ought to be ſhown to ſuch graſſes at this time of the year;—but as for rye-graſs, and other ſuch-like graſſes, though their roots divide themſelves into tufts, from the center of which alſo, as through a ſheath, the new ſpires of graſs ſpring up, yet it is but of one continued ſpring of graſs, not made up of diſſimilar parts, and ſo it has no leafy head to be taken off, to ſo great damage as the French-graſs has; but being bit off, it has ſimilar ſuccedaneous parts, which carry on it's growth, and ſo winter-feeding does not hurt it.

Of the roots of clover, &c. and inferences.

§. 23. My men were fallowing up a field that had been two years ſowed to broad-clover: I wondered to ſee ſuch abundance of ſlender carrotty-roots turned up by the plough, and ſtaring an-end; I plucked at them, and drew ſome of them up, and found they were the broad-clover-roots; I meaſured them, and found moſt of them to be eleven inches long in the tap-root: It is evident from hence of what conſequence the depth and ſtrength of the ſoil is as well to broad-clover-roots as to carrots and parſnips, and to hop-clover too; for quickly after I dug up a hop-clover-root of two years growth; it was in pretty good ſtrong ground, and I found it to be in length about ſix inches, and very thick, when compared with a root or two of the ſame year's growth; I pulled another root of hop-clover, in a piece of white-land, in the ſame ground, but it was very ſlender and weak compared with the other, and not ſo long.—From hence it is plain, as has been before obſerved, that in good land the colour is neither hurt by the ſun, nor tore up by the cattle, as it is in poor land: it is alſo apparent, from the deep penetrating of it's tap-roots, how neceſſary it is their mold ſhould be made fine and eaſy to them when they are ſown.—I alſo examined the rye-graſs, and I found it conſiſted of an innumerable number of ſhort hairy capillary roots, and conſequently feeds on the fat ſurface of the ground, and therefore at Midſummer, when ground is burning, it ſooneſt burns, and is beſt and chiefeſt in the ſpring, and at autumn; nor need ground be ſo fine, nor ſo deep, nor ſo rich for it, as for either French-graſs or clover. Rye-graſs improves for a year or two, or three years; whereas the clover dies away, and diſimproves the ſurface of the land, tho' indeed it improves yearly by paſturing of cattle, by the heat of the ſun, and by the moiſture of both rain and dew.

The good condition of the plant no argument that ground is proper to perfect the ſeed.

§. 24. The flouriſhing condition of plants is no argument for the agreement of the ground with them, in caſe the ſeed of ſuch plants be the fruit for ſake of which they were ſown; for, as before obſerved, the plant is the hardieſt part, and will often flouriſh in a ſoil much too cold to bring the ſeed of it to perfection; thus I can have rank barley-ſtraw, and rank broad-clover-graſs on my clay-grounds, where the ſeed of each will be cold and thin, nor will they come to due perfection.

Id. and inferences.

It is plain from the reaſons aforeſaid, that the ſeed-part of the ſeed is the tendereſt part of it, and that the plant, or herbaceous part of the ſeed, is the hardieſt part of it; ſo that one need not to be ſo very curious in changing the ſeed of any grain, tho' ſomewhat degenerated, when you ſow not to produce ſeed, but only to raiſe the graſſy or herbaceous part of the plant.—Therefore what gore or winter-vetches, tills, or clover-graſs you may ſow only for fodder for cattle will do very well from ſeed of your own growth, taking this caution, that every year you buy new ſeed for what you intend to let run to ſeed, and wherewithal to ſow your crops the ſucceeding year; except indeed you raiſe ſeed of winter-vetches of your own ſaving, it is impoſſible, if you ſow a great quantity of them, to procure ſeed time enough to ſow ſo early as that grain requires to be ſown; ſo remiſs are farmers in threſhing out their winter-vetches for the market.

Aftermaſs of broad-clover bad hay in the hill-country.

§. 25. Our Hampſhire hill-country is ſo cold, that the broad-clover aftermaſs ripens very indifferently, and the juices of it are very cold and ſour; ſo that, if the hay made of it ſods a little in the wet, tho' houſed afterwards never ſo dry, it becomes taſteleſs: this I had experience of in the year 1711; when I had ſuch hay that had taken wet, but was reeked very dry, and came out in good order; yet the cow-beaſts would not eat it for change ſo well as ſtraw, but made waſte of it; and the calves would not touch it; yet I could ſee nothing more than ordinary in it, but that it had loſt it's colour and ſmell, but was neither wet nor finnowy.

Hop-clover, if the ſummer proves dry, laſts but one year.

§. 26. I have obſerved, that, if a ſummer proves dry, hop-clover will not hold above one year; either the ſheep, feeding it cloſe, pull it up by the roots, or elſe the root not ſtriking deep has no ſhade, and ſo is burnt up by the ſun.—But I have a great preſumption, that that evil would be remedied, if we laid our grounds down in good heart to hop-clover; for then the root would ſtrike deep, and would neither be injured by feeding at ſtubble-time, nor by the heat of the ſun in ſummer.

Management of broad clover in Wilts.

§. 27. Mr. Townſend of Caln, in Wilts, tells me, that thereabouts they make great advantage of ploughing the aftermaſs of broad-clover into the ground the ſecond year, and then ſowing wheat on it:—they roll it down, he ſays, and ſome, who have ſheep, tread it down before they plough it in.

The younger the root the ſweeter the graſs.

§. 28. The extraordinary fineneſs of the wool, about All-cannons in Wiltſhire, is imputed to the richneſs of their arable land, which bearing continual ploughing, the graſs that ſprings up in the fallows is thereby always young and tender, as proceeding from annual ſeeds, not from old roots: it holds as a general rule in graſſes of all ſorts, that the younger the root the ſweeter the graſs. So broad-clover, and hop-clover, and rye-graſs too, are much ſweeter the firſt year than the ſecond; it ſeems therefore to be good huſbandry in the hill-country of Hampſhire to plough-in the ſecond year's broad and hop-clover, becauſe, as it is coarſer the ſecond year than the firſt, ſo it muſt be very coarſe feed in the hill-country, where it is often ſour the firſt year.

Of ploughing-in clover in the vale and hill country.

§. 29. It ſeems to me, that in the vale, where the land is good, and lies warm, and brings the broad-clover forward, and where they ſow wheat late (the latter end of October, or after) they may plough-in the broad-clover pretty early in the ſpring, viz. by the middle of May, it having been hayned up early for that purpoſe; for by that time there may be a good burden, being ploughed-in, to improve the ground with, and there will be time enough to ſow it, either on the ſecond, or on the third earth; for the clover will have time to rot by Michaelmaſs; but in the hill-country, where both the land and the air are cold, and conſequently cannot bring the broad-clover forward to a good head early enough in the ſpring, and where we ſow wheat very early (in Auguſt, or the beginning of September) I do not ſee how we can have a burden of broad-clover on the ground early enough in the ſpring to have time, when ploughed-in, to rot, and to give the ground any more than one earth before ſeed-time.—Therefore, in the hill-country, I rather adviſe to feed the broad-clover early in the ſpring, and then hayn it up, ſo that a good burden may be ploughed-in by the latter end of July, taking a dry time for doing it, in order to ſow wheat on the back of it, i. e. on one earth, in Auguſt, or by the middle of September at fartheſt.

Advantage of broad-clover beyond hop-clover.

§. 30. Amongſt other advantages of ſowing broad-clover beyond hop-clover one is, that, as I have obſerved, few thiſtles, docks, or other trumpery of weeds come up in my broad-clover grounds, in compariſon of what come up in the grounds ſown with hop-clover; for the broad-clover ſpreading, and covering the ground ſo much more than the hop-clover does, it kills the weeds; it alſo grows taller than hop-clover, and runs up to a good height the ſecond year's growth, which hop-clover does not, and is a great means to ſuppreſs weeds. The growth of weeds in my hop-clover cannot be imputed to the foulneſs of the ſeed, becauſe I uſe milled-ſeed.

Broad-clover bad in land laid down to graſs in Leiceſterſhire.

§. 31. Mr. Herrick aſſured me from experience, that, if, on their rich land in Leiceſterſhire, broad-clover was ſown, when the ground was intended to be laid down for a long time to natural graſs, the broad-clover would, when it decayed, prevent the ground from ſwording to natural graſs.—This may very well be in ſuch grounds as naturally run to graſs, as the rich lands of Leiceſterſhire do, inaſmuch as the broad-clover may deſtroy the very roots of the natural graſs, and kill the ſeedlings that may lie in the ground, and would come up, were they not checked.

§. 32.

The poorer the ground the cloſer you muſt feed ſown-graſſes.

§. 32. The poorer the ground is the cloſer you ought to feed down the ſown-graſſes: broad-clover and hop-clover ought to be fed down almoſt cloſe to the root; for, if either broad-clover, or hop-clover graſs be ſown on white-land, or be out of proof by the poverty of the ground, and you let them run but to a full-grown leaf, it will be of a foliomort colour, and ſpeckled with black ſpecks, which is a blight occaſioned by the weakneſs of the ground, and ſuch graſſes, eſpecially hop-clover, will eat bitter, and therefore the graſs of ſuch ground ſhould be always kept fed down cloſe with ſheep; for, if you let it run up high enough for a bite for a cow, no cattle will eat it; ſo the rule holds, as well in ſown as natural graſſes, the poorer the ground is the cloſer to feed them down.

If clover be thin and ſickly when broke up, ſow vetches.

§. 33. If broad-clover, or hop-clover has a ſmall, thin, unſappy leaf, or looks of a foliomort colour, and is out of proof, whatever the nature of the ground be, and tho' generally kind for corn, yet truſt not ſuch a ground at it's firſt breaking up, neither to wheat, peas, nor barley, for it will diſappoint you: rather chooſe to ſow it to vetches, and if they prove well, you may then promiſe yourſelf a good crop of barley: this I have found by experience to be true.

Hop-clover aftermaſs comes to nothing, if ſown with broad-clover.

§. 34. If hop-clover and broad-clover be ſowed together, and mowed, the hop-clover aftermaſs will come to nothing; conſequently the aftermaſs of the broad-clover muſt be the thinner.

Hop-clover ſhort-lived.

§. 35. I conclude that the hop-clover commonly ſowed is not long-lived where it grows wild, as Mr. Ray ſays, in arenoſis & ſabuloſis (which I have often obſerved) not above two or three years, becauſe in all ſorts of ſoils that I have known it to be ſowed in, as well ſandy as gravelly, I never heard that it lived above two or three years.

Hop-clover preferred to broad clover. See §. 30.

§. 36. Notwithſtanding what I have ſaid of the advantages of broad-clover beyond hop-clover, yet I know many farmers are of opinion that hop-clover—is much ſweeter feed than broad-clover; and particularly one aſſures me, if a ground be ſowed half and half of each, the cattle will never touch broad-clover till the hop-clover is eát quite bare.—He judged the broad-clover to be a ſour feed; for, ſaid he, if cattle were put into a field of it, they would pare away the ſour graſs round the hedges quite to the earth before they would begin on the broad-clover; but he ſaid, the broad-clover hay was much better for either great cattle or ſheep than hop-clover hay, which nevertheleſs was good feed for ſheep, if well houſed, but the broad-clover hay was full as good as any other hill-country hay.

Caution to ſow twenty or thirty acres of broad-clover for fatting-beaſts in the hill-country. V. Fatting of cattle, §. 17.

§. 37. Though I think it anſwers my purpoſe, as well as others in the hill-country, to ſow hop-clover rather than broad-clover, yet it is very neceſſary for me every year to ſow from twenty to thirty acres of broad-clover, to ſupply me for a ſhort time with graſs for my great cattle, when other graſſes are either not ſo forward in the ſpring as to paſture them, or have been burnt up in a hot ſummer, and ſo have expired till they revive in aftermaſs; for inſtance, broad-clover may be very uſeful to uſher in the other ſpring-graſſes for a fortnight before hop-clover will be high enough to afford a bite for great cattle, and, if you mow the broad-clover, the aftermaſs will be of great uſe, when the vigour of the hop-clover is ſpent, as alſo that of the natural graſſes, which will come in turn after the hop-clover, and will hold till after the hop-clover is gone; the aftermaſs of the broad-clover will then fall in turn to ſupport that great ſtock of cattle maintained hitherto by hop-clover and natural graſs, which you could not otherwiſe have maintained, had you not had ſuch a quantity of broad-clover aftermaſs, or French-graſs aftermaſs, to receive them till the aftermaſs of the hill-country meadows, or the natural graſs paſtures, could be of growth enough for that purpoſe.

Hop and broad-clover compared, and which moſt enriches land.

§. 38. The farmers are very apt to ſay, that broad-clover impoveriſhes land, but hop-clover does not.—This, as it ſeems to me, muſt be underſtood, if they are both mowed; for then, broad-clover being double the burden, no wonder if thereby the ground be doubly exhauſted; on the other hand, both being fed, it ſhould ſeem, broad-clover maintaining twice the cattle that hop-clover will, acre for acre, it ſhould doubly improve the ground; but to abate of that it may be objected, that hop-clover being undeniably the ſweeter feed conſequently makes the richer dung, and therefore, being but half the quantity in burden, yet being fed may improve ground as much as broad-clover.—Cold clays are not fit however for hop-clover, and it appears to me, that the beſt barley ground is the beſt hop-clover ground.

Hop-clover good feed for beaſts till the 9th of June.

§. 39. I have obſerved, according to the forwardneſs or backwardneſs of the ſpring, that about the beginning of May the hop-clover will have run it's length to it's firſt flowering, and then it begins to be paſture for cows and young beaſts, and from thence it continues on flowering, joint by joint, as the neſt of bud-bloſſoms proceed on in growth, ſtill leaving a bloſſom behind on the laſt joint on a ſtalk below, and thus it will continue to do till about the eighth, or, as it did this year (1718) till the ninth of June, about which time it will have compleated it's height, and the topmoſt bloſſoms will then wither and run to ſeed; all which time, being about ſix weeks, the hop-clover graſs is very hearty for all great cattle, and they will eat it freely till about the 8th or 9th of June, tho' the bloſſoms of the loweſt joint are ſeeded; ſo long as the ſeeds continue ſoft and green, and do not turn blackiſh, ſo long the ſtalk alſo will retain good ſap; ſo until this time the hop-clover graſs may be depended on for paſture for all ſorts of great cattle; ſheep alſo will eat of it thus long very well, and will bite deep of the ſtalk.

Hop-clover feed judged of by it's ſmell.

§. 40. [i] It may be known, whether the hop-clover out of huſk is too much kiln-dried or not, as well by it's ſtrong flagrant ſmell as by it's colour and taſte; for it has a ſtrong rich ſmell, if not over-heated.

Hop-clover roots torn out of the ground by winter-feeding with ſheep, and inference.

§. 41. Walking in the hop-clover ground of the ſecond winter's growth on the 26th of January (anno 1702) I obſerved more particularly than I had done before, that not only many hop-clover roots had been drawn out of the ground by the ſheep, and lay without any hold at all, but half the hop-clover tufts alſo were more or leſs drawn out of the ground, ſome for inſtance half out, others not ſo much, but in general they were all of them jogged or looſened, which was occaſioned by the ſheep's being kept hard on them, and often biting in laſt ſummer's and this winter's feeding, but more eſpecially in this laſt winter, which proving very wet, the roots were the more eaſily looſened or drawn out; beſides by the great vacancies among the tufts of the clover, compared with the firſt thickneſs they appeared in after harveſt, it was viſible vaſt quantities had periſhed in the aforeſaid manner before the ſecond winter; nor can it but ſtand to reaſon, that by their roots being thus ſhaken, and half drawn out of the ground, they muſt be much weakened in their growth, and kept backward, no leſs than trees are that ſuffer by ſuch looſening at their roots.—This is therefore a ſtrong inducement to me to think ſummer-fatting of ſheep more profitable than a winter-breeding-ſtock, whereby the winter-charges of the latter is altogether avoided, and the clover, being winter-hayned for the ſummer-fatting, four times the quantity may be expected to be well-grown and deep-rooted, and, ſuch fatting-ſheep being to be well kept, there will be no danger of their much injuring the clover in the ſummer.

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[i] Mr. Miller ſays, in the choice of broad-clover ſeed that which is of a bright yellowiſh colour, a little inclining to brown, ſhould be preferred, but the black rejected as good for little.

Of wild white and red broad-clover or honeyſuckle. See §. 45.

§. 42. Mr. Webb of Mountain-farley ſowed the wild white and red broad-clover, or honeyſuckle, and it holds the ground and decays not: he ſays, it is practiſed in Suſſex; and that he had his ſeed from thence.

Of the melilot—nonſuch.

§. 43. [k] The melilot-leaves are generally nicked in the edges by ſome inſect that knaws them: Mr. Bobart and myſelf were looking on a plant of it in his garden, that was ſo bit;—he ſaid, he never ſaw a plant of it but what had it's leaves bit in that manner.—This cannot always be done by a worm in the ſame manner the peas are, for there were many collateral branches of it at Mr. Bobart's, which ſtood a foot and an half high, and had ſhot after it was out of the reach of the worm: quære therefore what inſect this muſt be.—It has alſo the name of trifolium caballinum in Italy, becauſe horſes are particularly fond of it—it ſeems it is an annual plant.

Of louſe-wort.

§. 44. Some will have the rattle-graſs to be called louſe-wort, becauſe it makes the cattle louſy. Ray, vol. 1. fol. 769. and Synopſis, fol. 162. In pratis ſterilioribus.

Of the honey-ſuckle-trefoil.

§. 45. The broad-clover graſs, which of late years (anno 1707) had obtainrd ſome credit, as a longer living graſs than the common broad-clover, and is ſown under the name of cow-graſs, I find to be the common purple trefoil, or honeyſuckle-trefoil, as deſcribed by Mr. Ray, vol. 1. fol. 944. diſtinguiſhed from the great purple meadow-trefoil, which has always hitherto been ſowed by the country farmers, and I doubt not but always will; for by experience I find the other not to yield half the burden, nor indeed, in poor ground, ſuch as in our hill-country we commonly lay down to graſs, to be a longer liver than the common ſort;—but both ſorts being natural to ſome lands, I doubt not but they will continue more years therein than when ſown in poor land, or in a ſoil not ſo agreeable to the genius of the plant.

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[k] They, who are deſirous of being acquainted with the culture of the melilot-trefoil, or nonſuch, may conſult Mr. Miller's Dictionary, under the article---Melilot. I believe there was very little of it ſown in the fields in our author's time, nor is it yet grown common.

Of the leſſer medic-trefoil, yellow bloſſomed.

§. 46. Mr. Holyday, a conſiderable clothier in Wiltſhire, was giving me an account, in the year 1707, that the Spaniſh wool was always troubled with a burr, and that, in cleanſing ſome of the fouleſt of it, there came off more coarſe foul wool than ordinary, ſo that he was tempted to lay it on his meadow-ground, to improve it, which brought forth a ſtrange ſort of graſs, that had laſted ever ſince, it being many years ago. It was, he ſaid, a three-leaved graſs, and brought forth yellow flowers, and abundance of burrs with ſeeds in them.—I found this to be one of the annual medics I had in my garden, with burrs for the ſeed-veſſels, and by it's ſeeding every year, I ſuppoſe, it maintained itſelf in his ground; but what I take notice of it for, is this; he aſſured me, in picking the Spaniſh fleeces there were none but what had more or leſs of the burrs in them, which is an argument to me, that the Spaniards ſow much of this trefoil, it not being a native of their country, but brought from Perſia.—Quære if it may not be a very ſweet feed to breed fine wool.—It ſeems to me in the leaf to taſte ſweeter than hop-clover: I went to ſee this trefoil, and found it to be the leſſer medic-trefoil that had ſmall burrs;—but I ſince find by the clothiers, that the Spaniſh wool has been coarſer for thirty years laſt paſt than formerly, which may be occaſioned by their ſowing theſe graſſes.

Of the cytiſus, or ſhrub-trefoil.—Medicago, Miller.

§. 47. Notwitſtanding the great character the Rei ruſticæ ſcriptores give of the cytiſus, or ſhrub-trefoil, for food for all ſorts of cattle and fowls, and Pliny ſays,—it is not in danger of being hurt by heat, or hail, or ſnow, non æſtuum, non gradinum, non nivis injuriam expaveſcit, yet the uſe of this trefoil is not to be transferred into our clime; for Mr. Bobart aſſured me, that the plant will not bear our winters, unleſs houſed in a green-houſe.

Columella commending the cytiſus for it's great uſe for cattle and fowl, ſays, there is no climate in which this ſhrub will not grow plentifully even in the pooreſt ſoil, neque eſt ulla regio, in qua non poſſit hujus arbuſculæ copia eſſe vel maxima, etiam macerrimo ſolo. fol. 187.—It will not, as above noted, endure our winters in England.

Rye-graſs.

§. 48. One of my tenants told me, rye-graſs was what they coveted in the Iſle of Wight beyond hop-clover; for, ſaid he, the rye-graſs will bear the winter, and keep to a good head, which the clover will not do: I have had, added he, an acre and an half of rye-graſs upon tolerable good ground, which I have hayned up from Michaelmaſs until within a week of Candlemaſs, and from thence to the middle of April it has kept fifteen ewes and fifteen lambs.

Though I diſapprove of dunging French-graſs and clover, for reaſons noted before, yet it is proper to dung rye-graſs; for it makes the roots of that tillow, and mat on the ground, to the utter deſtruction and ſuppreſſion of the couch-graſs.

Mr. Ray ſays of the gramen ſoliaceum, or rye-graſs; it is a perennial plant, with jointed roots, and propagates itſelf by ſending forth fibres from it's joints, fol. 1263.—And becauſe it's roots do farther propagate, I doubt not but it may be kept alive, by dunging it, many years longer than we uſually do, or by refreſhing it with ſoil, when after two or three years it begins to decay.

As rye-graſs does not improve land as other graſſes do, ſo it may be preſumed, if Dr. Woodward's doctrine be true, the rye-graſs roots, being very like the roots of oats, barley, and wheat, may feed on the ſame ſalts of the earth that the roots of thoſe grains do, and that the orifices of the rye-graſs roots conſiſt of the ſame angles with thoſe of the ſaid grains.

Rye-graſs generally laſts but three years: Mr. Lawrence, near Upcern, Dorſet, told me, that he had as much rye-graſs ſeed on eighteen acres of land as was worth twenty pound, and after the ſeed was threſhed out, the hay was better than oat-ſtraw fodder.—I ſaw a reek of it in his back-ſide, and an oat-ſtraw reek, which were both laid open to the cattle, and they would not touch the ſtraw, but had made ſuch an hole into the rye-graſs hay-reek, that it was ready to fall.—He ſaid, if it was mowed green, and not for the lucre of the ſeed, it was excellent good for cattle.—He ſells the ſeed for twenty-two pence, and two ſhillings per buſhel; and ſows three buſhels on an acre.

Mr. Oxenbridge ſhewed me ſome of his rye-graſs hay, and I thought it was very fine hay; he looked on it, he ſaid, as his choiceſt fodder for his ſheep:—he mowed it when in the flower.

Farmer Ryalls of Dorſetſhire affirmed, he had known experienced farmers ſay, that the very hee-graſs, after mowing the rye-graſs the ſame year it was ſowed, being ploughed-in, was as good as dunging, and would pay for the ſeed.

I find all farmers from experience do agree, that notwithſtanding rye-graſs will maintain as many cattle on an acre as hop-clover will do, yet it does not improve land for corn like hop-clover.—This muſt proceed from one of the following two reaſons, or partly from them both: viz. Firſt, the rye-graſs conſiſting of a multitude of matty fibres, which run on the ſurface of the ground, they gird and hold it ſo together, that when ploughed, they cannot be diſentangled from it's earth, which cannot therefore be made to work fine.——Secondly, the fibrous thready roots of rye-graſs having great likeneſs to thoſe of wheat and barley, as alſo the ſpiry graſs-leaf being much like the blade of thoſe grains, it may well be ſuſpected, that the rye-graſs roots ſuck ſimilar juices from the earth with the roots of thoſe grains, and ſo they may rob each other of their ſpecific nouriſhment proper to them; whereas, the roots of hop and broad-clover being like a carrot, and their leaves different from the blade of corn, they neither gird the earth together, nor feed on the ſame juices the aforeſaid grains are believed to do; for in all reſpects otherwiſe rye-graſs ſhould more improve the ground than hop-clover, not only as it feeds more cattle, but alſo as it keeps down all weeds, which hop-clover does not.

A farther reaſon why rye-graſs is not ſo natural to produce a good crop of corn as clover is, may be, becauſe rye-graſs and darnel are by many herbaliſts ranged, as baſtard ſorts of corn, amongſt the claſſes of corn: the roots of rye-graſs are ſweet and juicy, promiſing nothing of ſtrong concocted ſalts; whereas the roots of clover are very hot and tart, which argues that they have drawn to them and digeſted many nitrous and ſalt parts, which, when rotten in the earth, may well impregnate it.—Quære about the roots of peas-halm, and of the halm of vetches; for I much ſuſpect thoſe roots to communicate to the earth the ſame benefit that clover-roots do, and a greater benefit than only by mellowing it.

Of mowing cloſe to the ground, for the ſake of the feed.

§. 49. All plants with piked flowers, as ſaint-foin, and which carry a gradation of flowers one above another, on the ſame ſpike, put forth the lowermoſt bloſſoms on the ſame ſpike firſt, which go into ſeed in the ſame order, till at laſt the topmoſt buds flower and ſeed; and of plants which bear many flowers on a gradation of joints, as the pea, hop-clover, common crow-foot daiſy of the field, &c. I obſerve the lowermoſt bloſſoms on the joints blow and ſeed firſt; and I do ſuſpect, that all thoſe plants which carry their bloſſoms on in a ſucceſſive gradation of joints, have thoſe ſeries of joints all at firſt included in a huddle in one ſmall pod; at leaſt it has been ſo with as many as I have obſerved, and as before noted of the pea; which cluſter of bloſſoms ſtill advance upwards, leaving a joint bearing bloſſoms behind, and ſo on: thus it is in hop-clover; on which when it is in flower, the cattle for a ſhort ſpace of time feed but ſparingly, and on the uppermoſt parts, and topmoſt flowers, becauſe, the flowers on the lowermoſt joints being run to ſeed, the ſeeds eat bitter, which the cattle diſlike.—From hence it is obvious, that ſuch graſs mowed for ſeed ought to be mowed cloſe to the ground, and the ſtones to be well rolled down; elſe the beſt of the ſeed, growing on the lowermoſt joints, will be loſt.

Of French-graſs.

§. 50. [1] It is evident, that where French-graſs is ſown, on thoſe parts of each field, where the earth is weak, ſhallow, and poor, there the French-graſs will firſt decay.

§. 51. Being

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[1] Mr. Miller ſays, this plant, if ſown upon a dry, gravelly, or chalky ſoil, will continue eighteen or twenty years; but, if it be ſown upon a deep, light, moiſt ſoil, the roots will run down into the ground; and in a wet ſeaſon the moiſture will rot the roots, ſo that it ſeldom laſts above two years in ſuch places. This is eſteemed one of the beſt ſorts of fodder for moſt cattle, and is a great improvement to ſhallow chalky hills, upon which it ſucceeds better than in any other ſoil, and will continue many years. Mr. Liſle and Mr. Tull both agree with Mr. Miller in regard to it's being damaged by wet, but Mr. Tull will by no means allow that a ſhallow chalky ſoil is moſt proper for it. As he has wrote very largely on the culture of this plant, I imagine the following extract from his work may be agreeable to the reader.

EXTRACT from Mr. Tull, chap. 12. of St. Foin, or Sain Foin,--Sanum fœnum, Sanctum fœnum, or French-graſs.

There is a vulgar opinion, that St. Foin will not ſucceed on any land, where there is not an under ſtratum of ſtone or chalk, to ſtop the roots from running deep; elſe, they ſay, the plants ſpend themſelves in the roots only, and cannot thrive in thoſe parts of them which are above the ground.---I am almoſt aſhamed to give an anſwer to this.---'Tis certain that every plant is nouriſhed from it's roots (as an animal is by his guts) and the more and larger roots it has, the more nouriſhment it receives, and proſpers in proportion to it. St. Foin always ſucceeds where it's roots run deep, and, when it does not ſucceed, it never lives to have long roots; neither can there ever be found a plant of it, that lives ſo long as to root deep in a ſoil that is improper for it.---An under ſtratum

Wet or cold land improper for French-graſs.

§. 51. Being at Holt, I was told by Mr. Bailey and Thomas Miles (the winter having been exceeding wet) that the wet winter had killed abundance of French-graſs round about the country, eſpecially where it was near the clay,—and I found it to be ſo; therefore neither cold nor wet land are proper for French-graſs.

§. 52. Being

ſtratum of very ſtrong clay, or other earth, which holds water, may make a ſoil improper for it; becauſe the water kills the root, and never ſuffers it to grow to perfection. If there be ſprings near (or within ſeveral feet of) the ſurface of the ſoil, St. Foin will die therein in winter, even after it has been vigorous in the firſt ſummer, and alſo after it hath produced a great crop in the ſecond ſummer.---The lighter the land the ſeed will come up from the greater depth, but the moſt ſecure way is, not to ſuffer it to be covered deep in any land, for the heads (or kernels when ſwoln) are ſo large, and the necks (or ſtrings that paſs from the huſks to the heads) ſo weak, that, if they lie much more than half an inch deep, they are not able to riſe thro' the incumbent mold; or, if they are not covered, they will be malted[a].---The worſt ſeaſons to plant it are the beginning of winter and in the drought of ſummer: the beſt ſeaſon is early in the ſpring.---It is the ſtronger when planted alone, and when no other crop is ſown with it: the worſt crop that can be ſown with it is clover or rye-graſs; barley or oats continue but a little while to rob it; but the other artificial graſſes rob it for a year or two.—The qualities following are ſigns by which to chooſe good ſeed—viz. The huſk of a bright colour, the kernel plump, of a light grey or blue colour, or ſometimes of a ſhining black;—yet the ſeed may be good, tho' the huſk is of a dark colour, if that is cauſed by it's receiving rain in the field, and not by heating in a heap, or in the mow; and, if you cut the kernel off in the middle, croſs-ways, and find the inſide of a greeniſh freſh colour, it is ſurely good; but, if of a yellowiſh colour, and friable about the navel, and thin, or pitted, theſe are marks of bad ſeed. It's manure is ſoot, peat-aſh, or coal-aſh. The firſt winter is the time to lay it on, after the crop of corn is off.—(Note, other good farmers there are, who ſay no aſhes or manure ſhould be laid on St. Foin till it has been ſowed two years, for it will force it too much, and the crop will not laſt ſo many years if aſhes be ſowed as Mr. Tull directs.)—Be ſure to ſuffer no cattle to come on the young St. Foin the firſt winter, after the corn is cut that grows amongſt it; their very feet would injure it, by treading the ground hard, as well as their mouths by cropping it: nor let any ſheep come at it, even in the following ſummer and winter.—St. Foin is more profitable either for hay or ſeed than meadow graſs, for the latter, if not cut in good weather, is ſpoiled, and yet it muſt be cut in it's proper ſeaſon, which is but one, whereas there are four ſeaſons for cutting St. Foin, and if you are diſappointed in the firſt of theſe, you may ſtay till the ſecond, and ſo on; beſides the hilly ground whereon St. Foin is chiefly planted, is more commodious for drying the hay, has leſs of the morning and evening dews than the low meadows. The four times for cutting it are,—firſt, before bloſſoming,—ſecondly, when in flower,—thirdly, when the bloſſoms are off,—and fourthly, when the ſeed is ripe. He commends the firſt of theſe, which he calls virgin hay, much before the others for keeping working horſes in good eaſe, or fatting ſheep in winter, and prefers it even to beans, peas, and oats. He adds however that this ſort of hay is not to be had from poor ground, that is not cultivated, or manured with peat-aſhes, ſoot, or the like.—The ſecond, or that which is cut in it's flower, according to the moſt common practice, tho' inferior to the firſt, yet far exceeds all other kinds of hay commonly known in England.—The third, which is cut when the bloſſom is gone or going off, tho' greater in bulk, is much leſs valuable than the former two, and, after theſe three, you have a fourth chance for good weather when the ſeed is ripe.

To make St. Foin hay.—A day or two after it is cut, when dry on the upper ſide, turn the ſwarths two and two together, oppoſite ways, and the ground will require leſs raking. Make them up into little cocks the ſame day they are turned, if conveniently you can; for when it is in cock, a leſs part of it will be expoſed to the injuries of the weather than when in ſwarth.—Dew, being of a nitrous penetrating nature, enters the pores of thoſe plants it reaches, and during the night poſſeſſes the room from whence ſome part of the juices is dried out: thus it intimately mixes with the remaining ſap, and when the dew is again exhaled, it carries up moſt of the vegetable ſpirits along with

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[a] Mr. Liſle differs from him in this, and adviſes, if the ground work light and fine, to ſow St. Foin under furrow. See—Of ſowing St. Foin.

Dunging not good for French-graſs.

§. 52. Being at Mr. Jeremy Horton's in Wiltſhire, there were there Mr. Anthony Methwin and Mr. Holdway, clothiers, but experienced farmers, and I aſked them if they dunged their French-graſs; they ſaid, by no means; Mr. Holdway ſaid, they looked on it in Glouceſterſhire, that dung did little good to French-graſs,

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with it, which might have been there fixed, had they not been taken away in that ſubtle vehicle. If St. Foin be ſpread very thin upon the ground, and ſo remain for a week in hot weather, the ſun and dew will exhauſt all it's juices, and leave it no more virtue than is in ſtraw. Therefore it is beſt to keep as much of our hay as we can from being expoſed to the dews, while it is in making, and we have the better opportunity of doing it in this than in natural hay, becauſe we may more ſafely make it into larger cocks, for St. Foin cocks (tho' twice as big as cocks of natural hay) by the leſs flexibility of the ſtalk admitting the air, will remain longer without fermenting.—When the firſt cocks have ſtood one night, ſpread two, three, or more together in a freſh place, and, after an hour or two, turn them, and make that number up into one cock; but when the weather is doubtful, let not the cocks be thrown or ſpread, but inlarge them, by ſhaking ſeveral of them into one, and thus hollowing them to let in the air, continue increaſing their bulk, and diminiſhing their number daily, until they be ſufficiently dry to be carried to the reek. The beſt hay I ever knew in England, was of St. Foin, made without ſpreading, or the ſun's ſhining on it. This way, tho' it be longer ere finiſhed, is done with leſs labour than the other.—If St. Foin be laid up pretty green, in ſmall round reeks, with a large baſket drawn up the middle, to leave a vent-hole for the moiſture to tranſpire, it will take no damage. Theſe reeks, as ſoon as the heating is over, ought to be thatched; and all St. Foin reeks, that are made when the hay is full dried in the cocks, ought to be thatched immediately after the making them.

The ſeed is good for provender. and three buſhels of it, ſome ſay, will go as far in nouriſhing horſes as four buſhels of oats. All cattle are greedy of it; I have known hogs made very good pork with it, but whether it will fat them well for bacon, I have had no trial.—The threſhed hay alſo, when not damaged by wet, has been found more nouriſhing to horſes than coarſe water meadow hay, and, when cut ſmall by an engine, is much better food for cattle than chaff of corn.—It requires ſome experience to know the proper degrees of ripeneſs, at which the ſeeded St. Foin ſhould be cut, for the ſeed is never all ripe together, and, if we ſhould defer cutting till the top ſeeds are quite ripe, the lower, which are the beſt, would ſhed, and be loſt.—The beſt time to cut is, when the greateſt part of the ſeed is well filled; the firſt-blown ripe, and the laſt-blown beginning to be full.—The colour of the kernel is grey or blueiſh when ripe, and the huſk, that contains it, is of a browniſh hue, but both of them continue perfectly green for ſome time after full grown, and, if cut in this green plight, will ripen afterwards, have as good a colour, and be as good in all reſpects as that ripened before cutting, add to which, there will be leſs danger of it's ſhedding.

St. Foin ſeed ſhould not be cut in the heat of the day, while the ſun ſhines out; for then much, even of the unripe ſeed, will ſhed in mowing: therefore, in very hot weather, the mowers ſhould begin to work very early in the morning, or rather in the night; and, when they perceive the ſeed to ſhatter, leave off, and reſt till toward the evening. After cutting we muſt obſerve the ſame rule as in mowing it, viz. not to make this hay while the ſun ſhines.—Sometimes it may, if the ſeed be pretty near ripe, be cocked immediately after the ſcythe; or, if the ſwarths muſt be turned, let it be done while they are moiſt, not two together, as in the other hay aforementioned. If the ſwarth be turned with the rake's handle, 'tis beſt to raiſe up the ears firſt, and let the ſtub-ſide reſt on the ground in turning; but, if it be done by the rake's teeth, then let them take hold on the ſtub-ſide, the ears bearing on the ground in turning over. It is commonly rain that occaſions the ſwarths to want turning, or otherwiſe, if the ſwarths are not very great, we never turn them at all; becauſe the ſun or wind will quickly dry them.—Sometimes, when we deſign to threſh in the field, we make no cocks at all, and but only juſt ſeparate the ſwarths in the dew of the morning, dividing them into parts of about two feet in each part. By this means the St. Foin is ſooner dried than when it lies thicker, as it muſt do, if made into cocks: but, if it be cocked at all, the ſooner it is made into cocks the better; becauſe, if the ſwarths be dry, much of the ſeed will be loſt in ſeparating them, the ears being entangled together: when moiſt, the ſeed ſticks faſt to the ear; but, when dry, will drop out with the leaſt touch or ſhaking.

Of threſhing St. Foin there are two ways, the one, in the heat of the day, while the ſun ſhines, in the field, the other in the barn. Of the former, the beſt manner is, to have a large ſheet pegged down graſs, the dung chiefly encouraging bennet-graſs, and couch-graſs.—Mr. Methwin ſaid, he would not believe Mr. Holdway, who had formerly told him ſo, but dunged ſome of his French-graſs, and found that the dung nouriſhed a natural graſs, and cauſed it to come up upon the ſurface of the ground, but

down to the ground, for two men to threſh on. Two perſons carry a ſmall ſheet, and lay it down cloſe to a large cock, and with two ſticks, thruſt under the bottom of it, gently turn it over, or lift it up upon the ſheet, and carry, and throw it on the great ſheet; but, when the cocks are ſmall, they carry ſeveral at once, thrown upon the little ſheet carefully with forks; thoſe which are near they carry to the threſhers with the forks only, as faſt as it is threſhed, one perſon ſtands to take away the hay, and lay it into a heap, and ſometimes a boy ſtands upon it, to make it into a ſmall reek of about a load. As often as the great ſheet is full, they riddle it thro' a large ſieve to ſeparate the ſeed and chaff from the broken ſtalks, and put it into ſacks to be carried into the barn to be winnowed. Two threſhers will employ two of theſe little ſheets, and four perſons in bringing to them, and when the cocks near them are threſhed, they remove the threſhing ſheet to another place.—The ſooner theſe threſhed cocks are removed, and made into bigger reeks, the better; and, unleſs they be thatched, the rain will run a great way into them, and ſpoil the hay; but they may be thatched with the hay itſelf, if there be not ſtraw convenient for it.

The better the ſeed eſcapes the wet in the field, the ſooner it's own ſpirits will ſpoil it in the granary or barn. Seed threſhed in the field, without ever being wetted, if immediately winnowed, and a ſingle buſhel laid in a heap, or put into a ſack, will in a few days ferment to ſuch a degree, that it will loſe it's vegetative quality: the larger the heap the worſe; but I have known it lie a fortnight in ſwarth, till the wet weather has turned the huſks quite black; then threſhed in the field, and immediately put into large veſſels, holding about twenty buſhels each, and this ſeed has, by being often wet and often dry, been ſo exhauſted of it's fiery ſpirits, that it remained cool in the veſſels, without ever fermenting in the leaſt; and then it grew as well as any did that was ever planted. To prevent the fermentation abovementioned many ſpread it on a malt-floor, turning it often, or, when the quantity is ſmall, upon a barn-floor, but much of it is ſpoiled even this way; for it will heat, tho' it be ſpread but an handful thick, and they never ſpread it thinner: beſides, they may miſs ſome hours of the right times of turning it, for it muſt be done very often; it ſhould be ſtirred in the night as well as the day, until the heating be over; and yet, do what they can, it never will keep it's colour ſo bright, as that, which is well houſed, well dried, and threſhed in the winter; for in the barn the ſtalks keep it hollow; there are few ears or ſeeds that touch one another, and the ſpirits have room to fly off by degrees, the air entering to receive them.—The only way I have found to imitate and equal this, is to winnow it from the ſheet; then lay a layer of wheat-ſtraw (or, if that be wanting, of very dry threſhed hay); then ſpread thereon a thin layer of ſeed, and thus layer upon layer, ſix or ſeven feet high, and as much in breadth; then begin another ſtack; let there be ſtraw enough, and do not tread on the ſtacks. By this means the ſeed mixing with the ſtraw will be kept cool, and come out in the ſpring with as green a colour as when it was put in, and not one ſeed of a thouſand will fail to grow when planted. I have had above one hundred quarters of clean ſeed thus managed in one bay of a ſmall barn. We do not ſtay to winnow it clean before we lay it up in the ſtraw; but only paſs it thro' a large ſieve, and with the van blow out the chaff, and winnow it clean in the ſpring.—This field-threſhing requires extraordinary fine ſun-ſhiny weather, and therefore, in moſt ſummers, it is but a ſmall part of the day in which the ſeed can be threſhed clean out. They, who have but a little quantity, carry it into a barn early in the morning, or even in the night, while the dew is on it; for then the ſeed ſticks faſt to the ear: as it dries, they threſh it out, and, if they cure it well, have thus ſometimes good ſeed, but generally the hay is ſpoiled.—There are two misfortunes that attend carrying it in without threſhing. If carried in the dews or damp, the hay is ſure to be ſpoiled, if not both hay and ſeed, and, if taken up dry, the ſeed comes out with a touch, and the greateſt part is loſt in pitching up the cocks, binding and jolting in carrying home. To avoid this dilemma he relates a contrivance, which is intricate and impracticable to common farmers, and therefore I omit it.

Rats and mice are great devourers of this ſeed, and will take the kernels out ſo dextrouſly, that the hole in the huſk ſhuts itſelf up when the ſeed is out of it; but, if you feel the huſk between your finger and thumb, you will find it empty; alſo a ſackful is very light. Incurious perſons have ſowed ſuch empty huſks for ſeveral years ſucceſſively, and, none coming up, concluded their land improper for St. Foin.

but it did not enrich the French-graſs;---nor does it ſtand to reaſon it ſhould, the ſaint-foin root running down ſo deep into the ground that dung cannot reach it; yet it will make the ſtalks a little prouder, but will neither make the root to tillow, nor matt.

Of the growth of French-graſs, and caution not to feed it after Auguſt.

§. 53. On the ſecond of November (anno 1703) I looked into my French-graſs, to ſee the method of it's progreſſion in it's growth; I pulled up ſome roots of it, and waſhed them, and I ſaw plainly, that at the top the root divided itſelf into many tufted branches, which tufts carried a few branches or graſſy diviſions, which cloſed together, all folding, at the bottom of the tuft, one within another: in the center of theſe tufts were the ſoboles or miſtreſſes wrapped up by the ſaid folding branches, which ſoboles were deſigned for the ſpring-ſhoot. In ſome tufts the ſoboles were better grown than others, according to the vigour of the tuft: theſe tufts taken up with the roots ſeem to ſtand off at a little diſtance from the roots, ſo as, (being fed in the winter, by ſheep eſpecially,) to be obnoxious to be bit off, and ſo the ſoboles, the hopes of the ſpring, may be loſt; but, if you obſerve them whilſt in the ground, theſe tufts are ſo cloſely ſeated, and let into the very ground, that the ſoboles in the bottom of the tufts do not ſeem ſo much expoſed, but only the leafy branches round about the tufts, which are well grown, and not dependent on the ſoboles; for, if they are bitten off, the hopes of the ſummer-crop ſeems to be deſtroyed. Great regard ought therefore to be taken, in winter-feeding of this graſs, by obſerving how far the ſoboles are advanced upwards, and whether within the power of the ſheep to bite them off or not, before they are put into it. Beſides theſe ſoboles, mentioned to be ſituated in the center of each tuft, there appears here and there an eye, or a bud, in the upper part of the root, but juſt to be diſcovered, not ſo big as a pin's head, which in all likelihood makes but a very weak branch the next year, but grows ſtronger and ſtronger every year, and thickens, as wexing into tufts, ſtronger and ſtronger, according as freſh ſoboles may annually ariſe out of the center of thoſe of the laſt year's growth. Thus it ſeems, that what is but a ſoboles this year, thickens the tuft next year, and in it's center carries a new ſoboles, which grows ſtronger the more the tuft thickens; by what appears, the old ſpreading-branches of the French-graſs, ſuch as have grown up after the feeding of the aftermaſs till September, being of the nature of the winter-vetch, will endure the winter, and be the moſt vigorous branches of the next ſummer, if not fed; and whereas ſome ſay, you ought not to feed French-graſs after Chriſtmaſs, it ſeems they do well that feed it no longer, but they who feed it not at all after Auguſt do better.

Of the decay of French-graſs.

§. 54. I obſerved by digging up French-graſs roots, that their decay proceeds from the ſame cauſe that the decay of the broad-clover roots does, and that in clay-land they decay ſooneſt; this decay is occaſioned by the fibres periſhing, and then the canker takes the top, and eats downwards.

Beſt manner of winter-feeding French-graſs.

§. 55. After French-graſs is mowed, if you are reſolved to winter-feed it, I look on the following to be the beſt manner, firſt, to eat down all the wild natural graſs with ſheep, that being fine and green, by virtue of being ſhaded by the French-graſs, but will burn away if not eaten, and it ought alſo to be kept down; ſecondly, to feed down the remaining part of the French-graſs, which the ſcythe has left, but, after theſe are eaten, I would adviſe, that it ſhould be hayned till towards September, becauſe the roots of the French-graſs running down great depths are apt, till ſummer is over, to draw a great quantity of ſap, and, if during the months of June and July, eſpecially if rain ſhould fall, they ſhould put forth groſs buds, and tender ſhoots, and the cattle ſhould crop them off, the root might chance to be choaked by a plethory, whereas about September the roots ceaſe to draw in ſuch plenty of juices, and begin to be quiet, and, if the branches ſhould then be eaten off, the roots will not be ſo over-charged as to want branches to empty their redundancy of juices into.

Some plants killed by cropping, others not, and the reaſon.

§. 56. The reaſon why many plants are to be killed by often cropping, and yet the natural paſture-graſs no wiſe ſuffers by it, I conceive, is, becauſe the leaf of the natural graſs is a continued ſpire, and, when it is bit, lengthens itſelf out again by growth, and receives all the affluence of ſap in the root; and in caſe it could be bit below the leafy ſpire into the ground ſheath, yet in the tuft, from the ſame root, are a multitude of iſſues monthly and weekly breaking out, enough to receive the ſap from the roots, ſo that the roots cannot be choaked by a plethory. Now, the plants, which are to be killed, by being cropped at ſpring and at Midſummer, are thoſe, which being full of ſap, at thoſe times only do make iſſues of ſhoots, which, being cut off, the channels conſequently are taken away, and the exuberancy of the ſap muſt burſt the root-veſſels and kill the plant. Some plants there are, ſuch as hop-clover, broad-clover, and other trefoils, which may be ſaid to partake of both natures aforeſaid; for the trefoil, being bit off from it's pedeſtal or ſtalk, does not grow again, (as the ſpires of common graſſes do) that is, out of the ſame ſtalk do iſſue forth no new trefoil buds; therefore it ſeems good huſbandry to ſuffer the trefoil-leaf to come to ſome maturity before it is bit; but again, on the other hand, it has a property common with paſture-graſs, which is, to be continually putting forth buds and iſſues, one under another, from it's roots, capable to receive all redundancy of ſap; for which reaſon it is not killed by often cropping.

French-graſs aftermaſs not equal to natural graſs for fatting ſheep.

Not to feed it after Chriſtmaſs.

§. 57. At Holt in Wiltſhire, walking in the French-graſs with farmer Miles, I aſked him, whether he found the French-graſs aftermaſs good for fatting of ſheep; he ſaid, it was neither ſo good, nor would prove them ſo well as Engliſh graſs; for the ſheep would pick up the Engliſh graſs from amongſt it before they would heartily fall on the French-graſs.—He ſaid, the ſheep might feed the aftermaſs of the French-graſs till towards Chriſtmaſs without hurting it, and after that the hurt it received was not from the winter, nor by the froſts, but becauſe about that time, or ſoon after, it might ſpring and ſhoot up, and to take off that early ſhoot in the cold weather was that which might hurt it; for by the ſide of ſuch early ſhoot a little dwindling ſhoot would ſpindle.

§. 58. Mr.

Of French-graſs hay for ſheep.

§. 58. Mr. Short Baily aſſured me, that ſheep will feed very well on French-graſs hay, and make little waſte.—Mr. Randolph ſays, the ſheep will eat French-graſs hay till it be above three years old, but then it grows too ſtemmy.—Mr. Raymond ſays, in their country the ſheep eat French-graſs hay very clean, if the graſs be cut before it blows out in flower.

Different opinions on foddering in French-graſs.

§. 59. Mr. Anthony Methwin thought, that foddering of cattle in French-graſs would do it as much harm as winter-feeding.—Mr. Short Baily was of a different opinion, unleſs you turn in great cattle, which might tread it too deep; but he was confident, that folding or foddering with ſheep would do it a kindneſs.

Natural graſs deſtroys other graſſes.

§. 60. I have obſerved, where natural graſs comes up near a hop-clover or broad-clover root, that ſuch root will be but of ſhort continuance, and will inſenſibly vaniſh and die away before any of the reſt of the clover-graſs in the ſame field, about which no natural graſs comes up; which makes for what is ſaid by gardeners of thoſe graſſes, viz. that they and weeds impoveriſh the ground, and draw away the nouriſhment from the plants.—Natural graſs conſiſts of innumerable matty fibrous roots, which, without doubt, running on the ſurface of the ground, muſt feed on the nouriſhment which the clover ſhould have, and theſe graſſes do, I believe, ſo far rob the roots of trees of their nouriſhment, that the gardeners, who adviſe orchards to be ploughed up, among other advantages to the roots of the trees, think likewiſe, that thoſe trees may find a farther advantage by having ſuch graſſes deſtroyed from the ſurface of the ground.

Of rowet.

§. 61. The ſtrength and ſpirit of rowety graſs is obſerved, after the firſt ſnow that falls, if it lies a while on the ground, to go off very much, and to have little proof in it, to what it had before the falling of the ſnow.

The more you improve your grounds, the more rowet you will have after the corn is cut; for the ſtubble-land will carry a good graſs to maintain cattle till it is ploughed up again, and this will both ſave hay, and keep you from a neceſſity of threſhing out corn to a diſadvantage of price.

And of ploughing it in.

There is often a rowet in grounds, which your own beaſts, as being uſed to ſweeter graſs, will not eat, or ſometimes the growing ſeaſon of the year may not afford them opportunity to eat: in this caſe it will ſeldom be proper to buy in hungry beaſts to eat it up; for they may either be dear, or, when they have eat up your rowet, you will not know what to do with them, they not deſerving your ſweeter meat; therefore in this caſe I hold it to be more proper to plough-in the rowet, for the improvement of your land.

Of lob-graſs. Sign of poor ground.

§. 62. The graſs which country-people call the hooded-graſs, or lob-graſs, is apparently of but little value; for it grows up with a ſingle culm to a root, without graſſy leaves, or herbage about it's roots; it generally grows on the pooreſt ſort of ground; no wonder then, that ſo much of the ſeed of this is commonly ſeen among the rye-graſs ſeed that is ſold; for the lands, that are ſowed with rye-graſs, are generally poor in nature, and impoveriſhed farther by corn; ſo theſe grounds are apt to yield abundance of lob-graſs, for the bearing of which I hardly find any ground too poor; and I have obſerved, that poor ground will naturally carry a little crop of this graſs, tho' it can maintain no other ſort; the more therefore of this a certain indication of the greater poverty of the ground.—I have at this time, June the third (anno 1707) obſerved, that this graſs has perfected it's ſeed, in it's ſeed-veſſels, when other graſſes were but flowering, and as it's ſeed-veſſels eaſily fall, ſo they naturally propagate themſelves.

The way to deſtroy the lob-graſs, or hooded-graſs, is to feed your grounds to prevent it's feeding, or elſe to enrich them by manure, ſo that the tufted roots of better graſſes may ſo multiply as not to give room for the lob-graſs ſeed, which is a large ſeed, to take root; the roots of that graſs ſeeming to be very weak, as having but few fibres, and ſo may eaſily be juſtled out of the ground, as the innumerable fibres of other graſs-roots multiply by manure.—I ſuſpect the lob-graſs to be but an annual. The French ſow it, and call it fromentel.

The teſtuca avenacea hirſuta paniculis minus ſparſis grows on walls, and hillocks, and on linchets or balks in fields, and on dry places. Ray's Synopſis, 261.--This is what we call lob-graſs.

Of the crow-foot or meadow ranunculus.

§. 63. There are ſeveral ranunculi common in our meadows, which, when green, bliſter and ulcerate the fleſh; theſe the cattle will not touch, but leave ſtanding in the fields, and yet, as I am told, all ſorts of cattle will feed on them greedily, when dried and made into hay. Doctor Sloan, fol. 25, mentions this, to account for the caſſavis-root, which, tho' ſtrong poiſon when green, being baked makes wholeſome bread.

Dandelion no ſign of poverty.

§. 64. My meads are very full of dandelion; but I conclude it no ſign of poverty, Ray, vol. 1. fol. 244. ſaying, it grows in gardens, and areas, and paſtures, and flouriſhes through the whole ſummer.—I ſuppoſe it is a grateful bitter to the cattle; I do not find but they eat it very well either in graſs, or in hay.

Small hard graſs—ſign of poverty.

§. 65. The gramen minus duriuſculum, or ſmall hard graſs, grows plentifully on my white chalky lands, at Crux-Eaſton, not worth ſix-pence per acre.—Gerard ſays, this graſs is unpleaſant to, and unwholeſome food for cattle, and that it grows in moiſt freſh marſhes.—And Ray, vol. 2. fol. 1287. ſays, on walls and dry places: ſo that I find it is of the nature of moſs, which grows equally either on walls or wet places, where the ground is out of heart, and wants ſtrength; therefore ſuch grounds want their cordials.

MEADOWS.

Muſhrooms an indication of good meadow-land.

§. 1. FROM the obſervation I made of my own hill-country meads, I find, that an indication of the goodneſs of the ſoil may be ſeen in the muſhroom-ſeaſon, by it's bearing (if it be a healthy paſture) plenty of muſhrooms; for thoſe meads of mine, the goodneſs whereof I full well know, by my ſoiling and feeding them do bear the greater plenty according as they are in heart, and the parts of the ſame mead proportionably to the goodneſs of the ſoil; whereas thoſe meads, which are out of heart, bear no muſhrooms.

Dwarf flax in meadows, ſign of poverty.

§. 2. Linum catharticum, or dwarf-flax, Mr. Ray ſays, abounds in the drier paſtures, eſpecially on the hills.—I have great plenty of it in thoſe meads that are very poor, but in meads which are in very good heart, tho' only parted from the other by a hedge, none of it will grow: I take it to be a great indication of poverty, where-ever it grows, and indeed, dry and poor, and fat and rich are reciprocal terms, when we ſpeak of land; for dunging would moiſten ſuch dry lands, and alter their property, ſo that dwarf-flax would no longer take up an abode in them.

Of great and common meadow-graſs.

§. 3. Mr. Bobart aſſured me, that the great or greateſt of meadow-graſs, gramen pratenſe paniculatum majus, is the beſt hay of the meads, as being moſt graſſy or leafy, that is, the culms proceeding from the roots have the moſt gradus of leaves on them, and are very ſweet: the common meadow-graſs, gramen pratenſe paniculatum minus, has no leaves to it's culms, in compariſon with the other, and only an herbage from it's roots that is low; yet Ray, I find, ſays, it is greatly coveted by the cattle, but takes no notice of the former for that excellency. Vide alſo Ray's Synopſis, f. 257.—But Gerard ſays, the [a] common meadow-graſs, gramen pratenſe minus, grows on barren hills, and is only fit for ſheep, and not great cattle.

Moſs a ſign of poverty.

§. 4. It ſeems to me, that the cauſe of moſs in lands, or on trees, &c. is poverty: the Rei ruſticæ ſcriptores ſay, that poor, dry, and hungry land is ſubject to moſs, and it certainly is ſo; and we know alſo that a good ſtrong ſort of land lying wet, or a hill-country land on a cold clay, or lying ſhelving to the north, will be ſubject to moſs alſo, and yet the land may be of a good ſort, and value, when cured of the moſs.—Neverthekeſs the ſame reaſon as above may be given for the moſs abounding in the dry beggarly land as in the ſtronger ſort of land mentioned after; for what difference is there between land according to the firſt inſtance poor and dry, having no ſalts or vegetable ſpirits in it, and the other ſort of land, wherein the ſpirits are bound up, and chilled, and rendered unactive, by reaſon of the coldneſs of the earth, it's wetneſs, or it's lying to the north, ſo that it's ſpirits cannot be rarified, nor ſet on wing, in order to exert themſelves? what ſignify ſtrong liquors, or juicy herbs, put into a ſtill or limbeck, if there be no fire ſet underneath to move them, and make their ſpirits riſe?—Again, as to dry, poor, beggarly land, and as to trees bearing moſs, we may compare their ſtate to that of every dry ſtake or hurdle-hedge, in which, as the ſap and ſpirits of the wood are exhaled, which will be at a year's end, a moſs will grow on the bark, and more and more the ſecond and third year it ſtands, as rottenneſs comes on; and ſo the moſs on the body of a tree, or it's branches, is an infallible ſign of the poverty of the tree, at leaſt in thoſe places where it grows; it ſhews that it's fibres and fiſtular parts for conveying of juices, in thoſe arms or limbs, are decayed, or decaying, or by ſome accident rendered uſeleſs.

§. 5. Colu-

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[a] There is a middle ſort of meadow-graſs between theſe two.

The older the dung the worſe for meadows.

§. 5. Columella is of opinion that the older the dung the leſs profitable it is for meadows. Fimum pratis quo vetuſtius minus proſit, quia minus herbarum progeneret, &c.—Columella, fo. 106.

Why lime and aſhes uſeful to meadows.

§. 6. That hop-clover and wild broad-clover come up in meads, and paſture-ground, by ſtrewing aſhes and lime, and in ſome meaſure by chalking, ſeems to me to proceed from the heat of thoſe manures, which render the principles of vegetation more active, by attenuating them, and putting them into a briſk motion, whereby they become able to open and penetrate thoſe ſeeds, which are plentifully brought into the ground, by the feet of both men and beaſts; but the principles of vegetation were too languid before for that purpoſe; yet dung will in ſome meaſure do the ſame thing; ſoot alſo, as I have experienced in my meads, has the ſame effect.—It is alſo to be obſerved, that path-ways through meads and paſture-grounds are more ſubject to clover than other places, which proceeds from the ſame reaſon; thoſe paths by often treading become better land; feeding-meads for the ſame reaſon produce clover.—I queſtion much whether theſe manures laid on arable land that is laid up to paſture would under a long time produce the wild clovers, becauſe the ſeeds are not in plenty on the ſurface but by long time.

Of rolling meadows after floods.

§. 7. Mr. Wiſe's farm at Newnham in Oxfordſhire lying much on the water-meadows, it happened that his meadows, and the neighbouring people's were, juſt before hay-making time, overflowed, and exceedingly ſtranded; the neighbouring people cut their graſs in that condition, tho' hardly worth the cutting; Mr. Wiſe rolled his, which ſo lodged and faſtened the knots of every ſpire of graſs in the mud and ſtrand, that from the knots there immediately ſprung up a very rich aftermaſs, which he thought paid him the damage of loſing his firſt crop of hay, and he mowed it to his great ſatisfaction.

When to ſow graſs-ſeed in meadows.

§. 8. Columella recommends the ſowing of graſs-ſeeds in meadows that are thin of graſs, the ſeed to be ſown in a mild ſeaſon, about February, and then to dung the mead. fo. 110.

A meadow, tho' thin of graſs, ſhould be mowed.

§. 9. It was a very burning ſummer (anno 1702), and we had no hay in the meads, but only bennets, and thoſe not worth cutting: however the farmers and labourers all agreed, that it was for my profit to mow them, tho' it ſhould not pay the charge of mowing; for, ſaid they, the aftermaſs will prove away abundantly the better; whereas the graſs will not grow afreſh, unleſs the dying bennets be cut off, neither will horſes, nor other cattle eat the bennets all the winter; ſo the dead rowet will continue on the ground, and will prevent the growth of the graſs next ſummer, and ſpoil the mowing of the meads the next year, and further, the bennets, if not mowed, would hurt the eyes of the ſheep,—and they all ſaid, they knew this to be true by experience.

Benefit from feeding meadows.

§. 10. Walking in the meadows on the 28th of May (anno 1714) I ſaw it was very manifeſt, that by feeding the meadows for two years laſt paſt, inſtead of mowing them, I had greatly increaſed the broad-clover honeyſuckle, and deſtroyed the yellow rattle or coxcomb-graſs.

§. 11.

§. 11. When meadows have been foddered on in winter, take care to rake up the hay before the worms have drawn the ends of it into their holes; for then it will not rake up, but will both hinder the mowing, and make the new hay fuſty.

Of raking up hay after foddering on meadows.

§. 12. I think meadows ought to be hayned from about the middle of Auguſt till the end of October, that, the ſown graſſes then going off, there may be rowet till the latter end of December for odd horſes; I think this will pay beſt, and if then hayned, in caſe the meadows are in good plight, they will bring a head of graſs againſt lambing-time.

Of hayning up meadows.

§. 13. What up-lands you deſign for mowing, in order to make hay, ſhut them up in the beginning of February. J. Mortimer, Eſq. F. R. S. fo. 25.[a]

PASTURES.

§. 1. HAVING, as I thought, greatly improved Crux-Eaſton, by laying down grounds to graſs, that were more natural for bearing graſs than corn; I conſidered thereon, that I might greatly increaſe the number of my great cattle, i. e. my cows, &c. and I purpoſed to keep oxen, knowing that I had a length of graſs for a bite for them; but I found myſelf miſtaken in this reſpect; for our hill-country ground, though it be a clay, and improved by manure and paſturing; yet it is of a cold and ſour nature, and though, by giving it time to grow, it may carry graſs to a length to anſwer the aforeſaid purpoſes, yet the tops of ſuch graſs will be coarſe and ſour, as running to a length beyond what the ſtaple of the ground can well carry, and ſo will do leſs ſervice, in proportion to the length of time it will require to arrive to ſo great a growth as to maintain great cattle, than it would have done, by a leſs and a ſhorter growth, in maintaining ſheep; for the graſs, in ſuch caſe, being kept ſhort, and not of a length beyond what the ſtrength of the ground will carry it to, it is in proportion ſo much the ſweeter, and better for improving ſheep than it would be, when run to a greater length, for ſupporting great cattle; as the common ſaying is, A lark is better than a kite.— Again, the keeping of ſheep upon ſuch land will make a much quicker return, inaſmuch as the graſs, on hungry, or poorer paſture, will grow the faſter (when it is ſo kept down, by keeping ſheep on it, as not to exceed an inch in growth) than it could have done by keeping great cattle; in which caſe, tho' you let it grow to a greater length, ſuppoſe three times as long, it will require five times the time, or perhaps more, in growing the two inches beyond the firſt inch, than it was in growing that firſt inch: if all this be true, it is apparent, that on ſuch ground you may maintain a much greater number of ſheep in proportion than you can of great cattle; i. e. ſuppoſe the proportion of a ſheep to a cow to be five to one, you ſhall in this caſe be able to maintain ſeven or eight ſheep to one cow, and no one can doubt, where the land is equally fit for either, but that ewes and lambs will pay better than the keeping

Paſtures in the hill-country fitter for ſheep than great cattle.

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[a] See the article Hay.

keeping of cows: how little profit I can, in proportion, make of a dairy, in compariſon of what I can make of ſheep, I am fully convinced by the great turgid udders of the cows at Gauſuns, and the middling udders of the cows at Pomeroy in Wiltſhire, and the lank udders of my cows at Crux-Eaſton; nay, the cows at Holt carry much better udders than mine, and thoſe cows generally go with the ſheep, which ſhows the feed is much ſweeter than mine.

The goodneſs of graſs lies not in it's length, but in it's ſap.

§. 2. The proof of graſs, be it of the ſame ſort with that in another ground, lies not in it's length, but in it's ſap and groſsneſs; for, if a ground be poor in juices, the graſs will be ſo long in growing, and the ſun will ſo harden and confirm it's fibres, that it will eat hard, and afford leſs nouriſhment than the ſame ſort of graſs, and of the ſame height, which grew in half the time, the fibres of which will be tenderer than the other.

Sign of good and bad paſture.

§. 3. This is a general rule that may be depended on in paſtures; where graſſes are, that naturally grow in barren grounds, ſuch lands want manuring, and then the better ſort of graſſes, which carry ſtrong roots, will eaſily overcome ſuch poor graſſes, they having but weak roots, and ſuch paſtures are to be looked upon to be in a better, or in a worſe condition, according to the perfection and breadth of the leaf, and the length of the culm or panicle, which ſuch poor graſſes carry; again, if by manure you ſo alter the property of your paſture as to bring up the clovers, you muſt ſtill obſerve the breadth of the leaf ſuch clovers carry, and the largeneſs of the flower; for, if they arrive not to that growth you ſee them do in very good paſtures, you may be aſſured, your ground will ſtill pay well for farther dunging.

Of the richneſs of certain paſtures.

§. 4. Sir W. Raleigh, c. 3. fo. 31. ſays, Quintus Curtius makes this report;—that there are paſture lands lying between the rivers Tigris and Euphrates, which are of ſo rich a nature, that they dare not ſuffer the ſheep to lie long upon them for fear they ſhould be ſurfeited and killed,—which is incident to our rank graſſes, as clover, and quick-growing paſtures of natural graſſes, eſpecially in the ſpring.

Of ploughing up ferny rowety paſture.

§. 5. I have obſerved ferny grounds (which have lain long to rowety graſs, and to a ſour impoveriſhed graſs) fit almoſt for nothing but to make cattle louſy; I have ſeen theſe grounds ploughed up for two or three years, and laid down again without being ſown to graſs, and have often obſerved ſuch grounds to have put on a freſh face, and to have born a more ſappy and juicy graſs, and to have afforded a tolerable good paſture.—The reaſon of this I conceive to be, that theſe rowety graſſes (having for many years ſhed their ſeeds, of which the ground was full, and the ſeeds alive) being by the ploughing killed root and branch, the ſeeds of thoſe graſſes take root, and bring forth a young tender herb, which continues ſo for a few years, till the roots decay again, and then it is fit to be ploughed up again.

Of laying up paſtures for winter-rowet.

§. 6. As it is better to plough up lands at the latter end of July, or the beginning of Auguſt, for a barley, or a peas-fallow, than to fat ſo late in the year, as has been noted before, ſo it is better to lay up a graſs-ground at the ſame time of the year for a winter-rowet, ſuch as will endure the froſts, which will in all likelihood pay better than late ſummer-feeding: thoſe who can only uſe the preſent minute, and go to that which is moſt obvious, and for a preſent advantage, in a road with the crowd, muſt expect but a vulgar advantage.

Of hayning up paſture that have been fed.

§. 7. I was at Pomeroy in Wilts in October (1699) viewing lands with farmer Stephens: it was a mighty year for aftermaſs-graſs, and he gave me to underſtand, that he hayned the graſs-ground which he had fed all the ſummer, for winter-feed, that the cattle might then have a good bite, and kept feeding the aftermaſs-graſs after the hay was off, becauſe the graſs of the fed grounds is ſtronger than the aftermaſs-graſs, and will better endure the winter froſts, and ſnows; whereas, were the aftermaſs-graſs ſuffered to grow to a good height, it would, if froſts came, be quickly cut off, or, being waſhy and weak, if ſnows fell, it would be beaten down, and grow rotten [b].

DOWNS.

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[b] Mr. Miller, to whom the world is greatly obliged for his excellent dictionary, under the articles of Barley and Trefoil, complains of the ignorance, obſtinacy, and covetouſneſs of the farmers in ſowing graſs ſeeds with their corn, and he again repeats the ſame complaint, when he gives rules for laying down land for paſture.—— His argument againſt this practice is as follows.—If the corn, ſays he, has ſucceeded, the graſs has been very poor and weak, ſo that if the land has not been very good, the graſs has ſcarcely been worth ſaving; for the following year it has produced but little hay, and the year after the crop is worth little, either to mow or feed. Nor can it be expected to be otherwiſe; for the ground cannot nouriſh two crops; and, if there were no deficiency in the land, yet the corn being the firſt, and moſt vigorous of growth, will keep the graſs from making any conſiderable progreſs. So that the plants will be extremely weak, and but very thin, many of them, which came up in the ſpring, being deſtroyed by the corn, for where-ever there are roots of corn it cannot be expected there ſhould be any graſs; therefore the graſs muſt be thin, and if the land is not in good heart, to ſupply the graſs with nouriſhment, that the roots may branch out after the corn is gone, there cannot be any conſiderable crop of clover.——— In anſwer to this, the farmers argue from experience, and deny the fact, to wit, —“ that, if the corn has ſucceeded, the graſs has been poor and weak, and ſcarcely worth ſaving;” for they ſay, it very rarely happens that a good crop of corn damages the crop of graſs that is ſown with it, but, on the contrary, they acknowledge that the graſs has more frequently damaged the barley.——By neglecting to ſow graſs with our corn, ſay they, our ground lies idle, and we loſe a year’s profit; for they will not allow September to be the proper ſeaſon for ſowing graſs immediately after a barley crop, for a reaſon I ſhall hereafter mention, tho’ it may ſometimes ſucceed.—They aſſert that the corn is a ſhade and ſafeguard to the graſs, and that the latter is very ſeldom deſtroyed but generally protected by it;—that the roots will branch out when the corn is gone, and the graſs get up after harveſt, tho’ it had been before kept down by the barley;—that the roots of the corn taking up part of the ground appears to them to be of no real hindrance to the growth of the graſs after the crop is cut; for the roots of the corn dying away at the time the corn is cut, ceaſe to rob the graſs of it’s nouriſhment, and by their occupying part of the ground, the graſs is thereby prevented from coming up too thick, and the plants ſtanding at greater diſtances from each other have more room to tillow and ſpread; whereas, on the contrary, if clover were ſowed by itſelf, at leaſt in the common way of ſowing, it would be in danger of coming up too cloſe, and of running up into a weak ſpire;—that it is common, even on poor land, the firſt year after corn, to cut a ton of clover from an acre, on good land a ton and an half, and ſometimes two tons, which is ſuppoſed to be as great a burthen, and perhaps a greater, for the reaſons before given, than the ſame land would produce if ſown with graſs only.——As clover and rye-graſs however are but of a ſhort duration, they agree, that their crop is, generally ſpeaking, not very conſiderable the ſecond year, when they feed it off and fallow the ground for wheat. It appears notwithſtanding, from Mr. Liſle’s account even of this ſecond year’s crop of broad-clover, that it is not of that contemptible value that Mr. Miller has repreſented it; for in his obſervations on Graſſes, he reports, that twenty acres of broad-clover of the ſecond year did from the middle of April to the middle of May maintain twenty-three yearlings, and eight ſteers of four

years

DOWNS.

§. 1. I Think it very adviſable for gentlemen who have great downs, to plough a furrow acroſs them in ſome places, that they may turn the beſt of ſuch lands into arable; and they may have many incloſures, that, by reaſon of their poverty, may be fitter to be turned into rye-graſs downs than to be incloſed, and then not to be ploughed above once in five, ſix, or ſeven years.

BULLS and OXEN.

§. 1. [a] COLUMELLA and Palladius agree in the character of a good bull, that he ſhould be large in limb, gentle in temper, and of a middle age; for the reſt they refer us to what they have ſaid of the ox, for the only difference between them, ſays Columella, is, that the bull has a ſterner

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years growth, beſides a great many hogs, and yet the paſture grew on them, and run more and more to a head every day, though early in the ſpring the ſheep had fed it down bare, ſo that the ground was not hayned till the beginning of April, and the wind, as well as drought oppoſed the growth of the graſs; for no rain had fallen for five weeks before, and the wind had been north and eaſterly for ſix weeks, ſo that no graſs of any other kind did wag: and in another place, in comparing the profit of vetches with that of broad-clover, he ſays, the ſecond year's crop of clover is a very great profit beyond the rent of the ground.—The farmers however, admitting their crop is of no great profit to them the ſecond year, wiſh Mr. Miller could make good his aſſertion, and put them in a way of laying down land, which has been in tillage, to graſs, in ſuch manner as that the ſword ſhould be as good, if not better, than any natural graſs, and of as long duration; but, in their opinion, the chief rules he lays down are not practicable, eſpecially in large concerns, and among farmers in common huſbandry.—His firſt rule is, that when ground is laid for graſs, there ſhould no crop of any kind be ſowed with the ſeeds. This has been already anſwered.—His ſecond is, that the beſt ſeaſon to ſow the graſs ſeeds upon dry land, is about the middle of September, or ſooner, if there is an appearance of rain.—To this they reply, that graſs ſeed ſown at that time of the year is generally killed by the froſt; ſo that, if you ſow it at that ſeaſon, you are in great danger of loſing your whole crop, and, if you defer it to the March following, you loſe a year's advantage; it is much ſafer therefore to ſow it with corn in the ſpring, particularly on cold land, and graſs ſo ſown will be much forwarder the year following than that ſown in September.—But Mr. Miller has taken notice of this objection, and to obviate it, adviſes to well roll the ground in the end of October, or the beginning of November. This the farmers own might be of great uſe, but it muſt be on ground that is naturally very dry indeed, or it is not eaſy to be practiſed; for the misfortune is, the weather is commonly ſo moiſt during the months of October and November, that it is then exceeding difficult to roll the ground, which is wet and dawby at that ſeaſon, and cleaves to the roller, and there hardly happens one year in twenty that you can roll it.— His third rule is, to lay the ground down to graſs by ſowing the beſt ſort of upland hay ſeeds, and Dutch clover or white honeyſuckle. —None of the farmers I have had an opportunity of conſulting have any great experience in this kind of clover; their objection therefore to this manner of laying down ground ariſes from the difficulty of obtaining any great quantity of this fine ſort of upland hay ſeeds; for graſs for hay is cut before the ſeed is ripened, and out of ten buſhels of hay ſeed not three will be ripe enough to grow, and this laſt is the number of buſhels Mr. Miller adviſes to ſow upon every acre of land: beſides, ſay they, in all paſtures, be they never ſo fine, there will be ſpiry and benty graſs, which is what chiefly ripens, the finer graſs being kept down, and ſeldom producing much ſeed. They conclude therefore, that this may be a good rule for a gentleman, who has only walks in a wood or garden, or a ſmall piece of land to lay down to graſs, but that it will not be of any advantage to farmers, for it cannot be introduced into common practice.

[a] Membris ampliſſimis, moribus placidis, mediâ ætate; cætera fere eadem omnia, quæ in bubus; neque enim alio diſtat bonus taurus à caſtrato, niſi quod huic torva facies eſt, vegetior aſpectus, breviora cornua, toroſior cervix, ventre paulo ſubſtrictiore. Colum. lib. 6. cap. 20.

ſterner countenance, a livelier look, ſhorter horns, a brawnier neck, and a ſtreighter belly.

Marks and age of a good bull.

§. 2. I find by farmer William Sartain of Wilts, that a light headed bull, with thin horns, not thick at the root, is preferable, cæteris paribus. And the farmers of Holt ſay, a bull will live very quiet with oxen, or young beaſts, all winter, till towards May-day, when he may grow a little rank.

His age.

It is uſually ſaid, that a bull of two years old is the beſt to bull cows; but I find by experience, that if he be of the hill-country breed, he will, unleſs he be very well kept, be too ſmall to bull the cows of three and four years old.

Of his breed's degenerating.

§. 3. Mr. Raymond, who has better breeding paſture, and warmer ground than I have on the hills, ſays, that, if you have yearling heifers, and a yearling bull of the Glouceſter-brown kind for a choice breed, one muſt often be renewing, or keeping up the breed, by buying one of thoſe yearling bulls; otherwiſe the breed will ſoon degenerate.

Of a bull's killing oxen with his breath. See §. 7.

§. 4. I had, in November (anno 1711) an ox fell lame in the field, as he was ploughing, and I had, in the ſame field, my herd of kine, and a bull going with them; the bull had never been yoked; however the men ventured to take him, and yoked him to an ox.—The bull bellowed as he went along, for two or three turns, but without making any reſiſtance; he ploughed quietly that day, and the next; whereupon I was very well pleaſed, and thought to have continued ploughing with him, but my oxmen ſaid, if I did, he would kill the ox he went againſt.—I thought they meant by horning him, or bearing on him, but they ſaid, the bull would kill him with his breath.—I was ſurpriſed at the anſwer, and aſked how that could be; they ſaid, by blowing on him with his breath, which was very ſtrong, and that in Wiltſhire they, for that reaſon, always ploughed with two bulls together in the ſame yoke.—But, ſaid they, the ſtrength of their breaths preſently ceaſes on their being gelt.

The better caſe a bull is in the better he bears cutting.

§. 5. In the beginning of December (anno 1711) I ſent for the gelder of Kimbery to cut this bull, and he came and cut him, and he ſaid, he thought he would do well; but, as the bull ſeemed to be out of caſe, I aſked the gelder, whether that was better or worſe for him; he ſaid, they counted, that the better condition the bull was in it was the ſafer, and that he would bear it the better.

When good beef after cutting.

§. 6. Mr. Biſſy ſays, if a bull be gelt, his bulliſh nature will be ploughed out in three years time, and he will make as good beef as any ox.

A bull kills an ox with his breath, &c.

§. 7. It is agreed on all hands by the farmers about Holt, viz. by farmer Sartain of Broughton, farmer Stevens, farmer Loſcomb, &c. &c. that an ox does not care to plough ſide by ſide, or under the ſame yoke with a gale, or a bull, till his bulliſh nature is ploughed off, i. e. till a year at leaſt be ſpent in work; and the chief reaſon they aſſign for it is, that the oxen cannot abide the ſtrong breath of the gales; beſides, with their ſhort horns they can eaſily hit the oxen in the face.—They ſaid, it was plain the ſtrong breath of a bull will daunt an ox; for a bull of a year old was ſufficient to keep the largeſt oxen in order, amongſt an herd of cows, and to keep the oxen from riding them; for, as ſoon as the oxen once ſmell ſo ſmall a bull's breath, they preſently acknowledge his ſuperiority without conteſting it, and run away from him.—Many farmers for this reaſon will by no means yoke an ox with a bull, becauſe the bull's ſhort horns, as well as his breath, are apt to beat the ox out of the furrow, and to tire him, by his endeavouring to uſe an equal ſtrength to draw ſideways from the bull as to preſs forward.

Working young beaſts hurts their growth.

§. 8. The north-country beaſts that are of the weſtern parts, much exceed our's in bulk and weight; for, tho' we have as deep feeding in Somerſetſhire, and in the vale of Wiltſhire, as they have in the North, yet becauſe we work our bullocks, that ſtops their growth, whereas in the North they plough with horſes, and keep their bullocks unwrought till they are fatted and killed.

Signs, ſmall or large hoofs.

§. 9. Columella would have the oxen be provided with large hoofs, ungulis magnis, lib. 6. fol. 159. But the cows with ſmall hoofs, or of a moderate ſize, ungulis modicis, ib. fol. 166.

Of oxen heating and ſcouring.

§. 10. Being at Holt in Wiltſhire in May (anno 1711) Mr. Smith, my tenant of Deadhouſe, knowing that I had newly kept two teams of oxen, aſked me how they held out in ſeed-time that ſpring; I told him, very well, for the ſpring had been ſo cold all the ſeed-ſeaſon as not to make a trial how they would bear the heat; but, ſaid I, tho' it has been very hot weather ſince I have been in Wiltſhire, yet I did believe, that at my return I ſhould be informed they had born the heat well in their fallowing for wheat.—Now they have been at graſs near a month before the hot weather came, whereby their bodies are well cooled, there is no doubt, replied he, but they will endure the heat much the better; but the time for their being overcome with heat was in the ſpring, their bodies during the winter having been dried up with dry meat, eſpecially if any of the hay you gave them was mow-burnt or high dried, which would diſpoſe them to ſcour; the reaſon of which he thought to be, becauſe it heats them ſo much as to make them catch at every mouthful of green graſs, which ſets them on ſcouring; for which reaſon, he ſaid, his father uſed always in hay-making time to take particular care to dry a reek of hay thoroughly for his working oxen againſt ſpring, that it might not take any heat, but come out of the reek green, which colour it loſes by heating, and that though ſuch hay loſes much of it's ſmell, yet it is thereby made much cooler for the bodies of the oxen, and they will eat the more greedily of it.—He ſaid, he found, that in winter the oxen would eat heated hay without ſcouring as well as the horſes, and if French-graſs hay be well houſed, and cut green, he cannot make his oxen eat of it beyond Candlemaſs, but if over-dry and ripe, they will not eat it after Chriſtmaſs.—From hence it ſeems, the longer you can at firſt hand provide, and keep your oxen at aftermaſs, the better and cooler in their bodies will they be, when they come to their work in the heat of the ſpring; and ſo they will be, the leſs heated hay you fodder them with in winter.

Of breaking a young ox.

§. 11. [c] In breaking the young ox, Columella ſays, you ſhould not ſuffer him to ſtop midway in the furrow you are drawing, but always let him reſt at the end, that the hopes of reſting may incline him to go through with greater ſpirit. If your furrow be above 120 feet long it will fatigue him too much, and therefore it ought not to exceed that length. It may be obſerved here, that the meaſure of an acre of land was the ordinary quantitity that a yoke of oxen could plough in a day, from whence it took the name of jugerum; the furrow above-mentioned to be ploughed at one heat, was called actus, and was of 120 feet, and this being doubled in length made the two ſides of an acre, ſo that when Columella adviſes a furrow not to be carried above 120 feet at moſt, he intimates the cuſtomary manner of ploughing, and agrees with Pliny in aſcertaining the meaſure of the Roman acre, which is ſaid by the author laſt mentioned, to be 240 feet by 220: this contains 28800 ſquare feet; our acre contains 43560 Engliſh feet ſquare; ſo ours is near double the Roman acre. Two oxen therefore might, in pretty light land, very well plough a Roman acre in a day.

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[c] Sed nec in mediâ parte verſuræ conſiſtat, detque requiem in ſummâ, ut ſpe ceſſandi totum ſpatium bos

My oxhind took three of my ſteers to break them, and to inure them to the yoke; he yoked two of the ſteers, being two yearlings together, and ſo ſuffered them to walk about the ground, where there were no pits, nor ditches, for them to receive hurt by; he alſo tied the buſhy parts of their tails together; the reaſon of which was, becauſe they ſhould not be able to turn their heads to each other ſo as to ſtrike one another with their horns, or, by bending their necks too much, by endeavouring to face one another, and then ſtriving, break their necks; in this poſture he let them go in the ground, if without holes or ditches, all night, or elſe turned them into an empty open barn ſo yoked, and thus uſed them two or three times before he worked them.

Young beaſts beſt endure turning out at winter.

§. 12. If you turn off plough-oxen to lie by during the winter, in order to plough with them again in the ſpring, the young ſteers broken the ſummer before, which have not been houſed in winter, my ploughman judges beſt for that purpoſe, becauſe they'll beſt endure to lie abroad in winter: next to theſe the younger beaſts will beſt endure it.

A broad claw a ſign of a good working beaſt.

§. 13. Working makes oxen's claws grow larger and broader than otherwiſe they would do; therefore a broad full claw is a ſign that an ox is, or at leaſt has, been a good working beaſt, for hard working and free working will, either of them, make an ox's claws ſo to grow, becauſe a hard working, eſpecially a free working beaſt, puts his claws ſtrong to the ground as he treads, and thruſts them hard againſt it, which will cauſe the aforeſaid effect; whereas a falſe working beaſt will tread tenderly and lightly on the ground, and conſequently never ſpread the horn of his claw.

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bos agilius enitatur: ſulcum autem ducere longiorem quam pedum centum viginti contrarium pecori eſt; quandoquidem plus æquo fatigatur, ubi hanc modum exceſſit. Colum. lib. 2. fol. 98.—— Jugerum vocabatur, quòd uno jugo bovum in die exarari poſſet; actus, in quo boves agerentur, cum aratur, uno impetu juſto; hic erat 120 pedum, duplicatuſque in longitudinem jugerum faciebat. Plin. lib. 18. cap. 3.

Of cuing oxen.

* ſhoed.

§. 14. I always ordered my oxhind, the morning the oxen are to be * cued, to tie them where they may ſtand in ſome muck-hill, or moiſt place, in order to ſupple their claws; for as our nails, after waſhing our hands, pare the better, ſo will their claws do the ſame, and the nails drive the eaſier. After cuing the oxen are always tender in their feet, and therefore ſhould be favoured for a day after, and not worked in hard or ſtony ground, and, if they are at ſtall in the winter, the dung from their hinder feet ſhould be flung forwards under their fore feet to keep them ſupple; their hinder feet will be moiſt enough of courſe.

If you fling off plough-oxen for the winter, it is good to new cue them, or at leaſt to turn them off with good cues on their feet; for, when they are not worked, their cues will laſt a long time, and in the mean while their claws will grow out well, and harden againſt ſpring.

It is not proper to let oxen go to carting in coppices within two or three days after being cued, till the cues are a little ſettled to their feet; otherwiſe they may be apt to tear them off amongſt the ſtubs of the coppices.

Of pitching their feet.

§. 15. Cato, fol. 13. ſays, you ſhould anoint the bottom and inſide of your oxen's feet with liquid pitch before you drive them on the road, that they may not wear out their hoofs.—I do not perceive, tho' they uſed oxen ſo much, that they ſhoed them.

Of drawing by the horns.

§. 16. [d] Columella takes notice of the cuſtom in many of the Roman provinces of drawing by, or, as he terms it, fixing the yoke to the horns, and ſays it is condemned by all the writers on huſbandry, and not without cauſe, for oxen cannot draw with that force by their horns as by their necks and breaſts.

A man better than a boy to go with the ox-plough.

§. 17. I am of opinion there is nothing ſaved by taking a boy to drive an ox-plough, though you plough with but ſix oxen; a man will keep ſo much the greater awe over them, and will make them go trig; nay, there is a conſiderable benefit, if two men go with the plough, for them to change hands in the middle of the day, and drive by turns; ſo much more notice will the oxen take of a different voice, that it will quicken them.

Of feeding oxen after work.

§. 18. About half an hour, or ſomewhat more, after my oxen came home from their day's work of harrowing-in oats, I went into the ox-houſe, to ſee what order things were in there; my oxen were all laid down in their ſtalls, chewing the cud, but no meat in their racks, not a ſingle ſtalk of hay; I thought this hard uſage, unleſs my ploughmen had firſt fed them, before they went to their dinners, and the cattle had eaten that ſerving up; therefore I aſked my head-oxherd concerning it; he ſaid, they never ſerved their oxen with freſh hay at their firſt coming from work, but there was always ſome of the oughts or leavings of their breakfaſts left in the racks for them, which was then, when they were hungry, welcome to them, and they re-

[d] Illud, quod in quibuſdam provinciis uſurpatur, ut cornibus illigetur jugum, fere repudiatum eſt ab omnibus, qui præcepta ruſticis conſcripſerunt, neque immerito; plus enim queunt pecudes collo & pectore conari quam cornibus. Colum. lib. 2. fol. 98.

quired them firſt to clear the racks of that before they gave them freſh hay.—I note this, becauſe ſome idle hinds might fling ſuch oughts out to the dunghill. The evening oughts or leavings, if the oxen will not eat them, ought to be laid by for horſes, &c. becauſe, their bellies being well filled over night, they are nicer in their food in the morning, and muſt have freſh meat.

Of keeping oxen's backs dry, and of foddering them with ſtraw in winter.

§. 19. After many years uſing my ox-teams I was (anno 1719) almoſt inclinable to diſpoſe of them, they being ſo chargeable to me in winter, in hay and vetches; but, whilſt I had theſe thoughts, a Wiltſhire farmer, of whoſe judgment I have a great opinion, told me, he ſhould think I might at leaſt keep one ox-team very advantageouſly, if it were only to help eat up my winter-ſtraw, my cow-cattle not being ſufficient for that purpoſe;—to which I replied, that to keep oxen all winter to eat up my ſtraw would do me little ſervice, when by vertue and ſtrength of the ſtraw I could not pretend, in winter, to do any work with them;—to which he anſwered, that was a miſtake; for I might very well work them ſome time after they had eat up their fodder in a morning, viz from nine o'clock till two, if I put them not to too hard work, and that ſuch working every other day would rather do them good than harm, and would get them a ſtomach to their meat.—I made a ſcruple of working them ſo many hours, and ſaid, I could contrive work for them of great uſe to me, and work them but from nine till twelve;—but he inſiſted, that I might work them from nine till two, if I contrived it ſo as to give them the beſt of my ſtraw, tho' he acknowledged that ſtraw was not ſo good with me as with them in the vale; he ſaid farther, that nothing in winter beat out cows or oxen more than their being wet on their backs or loins; it was therefore of great conſequence to keep them dry over head, in order to hold them to their proof; for, if cattle carried their hides wet day by day, it was as bad to them as it would be to us to wear wet cloaths, and muſt make them ſink or pitch.—From hence I reſolved, that I would oblige my ſervants, during the winter, at leaſt in wet weather, to tie up my cow-cattle in ſhed-houſes, and to bring up my oxen from their ſtraw abroad, in wet weather, to eat it in the ox-houſe;--and for the ſame reaſon it ſeems to me, that, if I work my oxen in winter, as above propoſed, by vertue of ſtraw, I ought not to work them in cold and wet weather; for working in one ſuch day, will beat them out (as the farmer called it) and make them to pitch more than working three days in dry weather.—To this however I objected, that, tho' I tied up my cows and oxen in wet weather, yet I could not avoid letting them out to water in the wetteſt day, and though it rained never ſo hard;—to which he replied, that letting them out to water at ſuch a time would do them no hurt; it was only their continuing in the wet for hours together that did them prejudice.—He ſaid farther, that, if I put the cows or oxen under ſkillins, or penthouſes, though they lay open to the air and wind on one ſide, that mattered not, provided their backs were dry.

Not beyond ſix or ſeven years old.

The ſame farmer making me a viſit, I told him what good ſucceſs I had had in foddering my oxen with ſtraw the laſt winter, and how well notwithſtanding they did their work.—He told me, he did not doubt but they would do ſo, otherwiſe he would not have perſuaded me to it; but, ſaid he, I would not adviſe you to keep oxen, you propoſe to work, with ſtraw in winter to above ſix, or however, not to above ſeven year old at fartheſt; for, when oxen are paſt that age, they fall off of their ſtomachs more than younger cattle will, nor can they hold their fleſh with ſo coarſe meat, and work withal, as younger cattle can.

Chaff for oxen.

§. 20. Barley-chaff is not proper for oxen, but wheat, and oat-chaff they may eat: the barley-chaff is apt to ſtick under the roots of their tongues.

Vetches for oxen.

§. 21. The plough-oxen may eat freely of the winter-vetches, and they will do them the moſt good at the beginning of winter, before they are forced to be houſed, and whilſt they have yet ſome graſs left in the field to eat along with them; for the cold rowety graſs, and the dry and hot winter-vetches will qualify one another.

By all means, however, if, in the hill-country, you pretend to fat oxen, or to work oxen in the plough, take care to have a good reek of old vetches in ſtore againſt ſummer; for it will rarely happen but they will have great want of them, at leaſt throughout the whole month of July; for, the paſture-graſs in the hill-country, either burning up, or giving off growing by Midſummer, it is the oxen and cow-cattle's * bennetting-time, till a freſh ſpring ſhoots up by means of rain in Auguſt, when the corn-fields begin to open to their paſture, though the ſheep which bite cloſe may fare well: at this time ſuch a proviſion of vetches to go on with the rowet, and the ſmall pickings of graſs left, will be a vaſt ſupport to, and of great conſequence with the oxen, nor is the want of old reeked vetches, in this caſe, to be ſupplied by green vetches, which at this time of the year may be had in plenty; for, though at this ſeaſon they are a good maintenance for horſes, yet they are unkind to the horned cattle, and will be apt to ſcour them, and to make them ſick.

* or benting.

Of giving them hay in ſmall parcels.

§. 22. It is agreed by the Wiltſhire farmers, that from about the beginning of March to the beginning of May, i. e. till the ploughing oxen are put to graſs, more eſpecial care ought to be taken to give them hay in their rack, in little parcels, ſmall pittances at a time, becauſe, the hay then growing dry, and the oxen growing hot, their breath will be ſo much the more apt to blow their fodder, and then they will not eat it.

Of ſcrubbing poſts for oxen. To ſave the dead hedges.

§. 23. In incloſures in the hill-country, where there are dead hedges, eſpecially if oxen are kept there, rugged poſts ſet up in the fields, for them to ſcrub againſt, will be of great uſe to the oxen, as well as a ſafeguard to the hedges.

Of houſing oxen when their backs are dry.

§. 24. It was the 15th of November (anno 1713) when my oxhind propoſed to me to take my plough-oxen into the houſe for the winter, it being then dry and mild froſty weather; on the contrary my bailiff was of opinion, that they might, for that reaſon, lie out a few days longer; but the other ſaid, the weather being dry was the reaſon that he propoſed houſing them at firſt when their backs were dry; for it is a ſaying in Wiltſhire amongſt ploughmen,

men, that, if in winter you ſtayed till the rain came before you houſed oxen, and then their backs were wet when you firſt houſed them, their coats or hair would be apt to peel off in the winter.—[e] The antients are very particular in their directions to keep the backs of oxen dry, and to rub them well when they come from work, and pull up their hides that they may ſit looſe and not cling to their fleſh.

COWS and CALVES.

§. 1. [a] TO keep cows from being high in caſe before bulling, and the bull to be in high caſe is Columella's rule, as well as Varro's. [b] It appears alſo by Columella, that in Auguſt and September they gave their cows leaves as a good part of their food. [c] He is likewiſe of Varro's opinion, that, if the bull turns off to the right, it is a bull-calf, and, if to the left, it is a cow-calf, but that only in caſe the cow takes not bull again, which rarely happens. [d] He and Palladius are in general agreed on the marks that diſtinguiſh a good cow, to wit, that ſhe ſhould be tall in ſtature, long in body, of a vaſt belly, broad forehead, black large eyes, neat, light horns inclining to black, hairy ears, flat jaws, a dewlap and tail very large and long, hoofs and legs of a moderate ſize.

Choice of a cow.

§. 2. Markham in his Country Contentments, fo. 71, ſays, in the choice of a cow, ſhe ſhould ever have four teats, but no more; her forehead broad and ſmooth; her belly round and large: a young cow is the beſt for breed.

Marks of a good cow.

§. 3. A notable dairy-woman informs me, that in Leiceſterſhire they obſerve, and ſhe has obſerved the ſame herſelf, that a cow with thick horns, which do not leſſen and thin in a taper manner, gives not ſo much milk as the cows with ſlender horns do.

Mark of a fat cow.

§. 4. If you would chooſe a cow to feed, handle her navel, and, if that be big, round and ſoft, ſhe is ſurely well-tallowed. Markham, lib. 1. fo. 62.

A good cow known by the thriving of it's calf.

§. 5. When a cow has a calf, one may diſcover by the thriving of the calf, as ſoon as by any thing whatſoever, whether the cow gives very good and rich milk, or that which is but waſhy; but ſome, when they bring the cow and calf to market, will beforehand fill the calf's belly with two cows milk; but then the cow's udder, by it's fulneſs, will be apt to ſhew it.

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[e] Boves, cum ab opere disjunxerit, ſubſtrictos confricet, manibus comprimat dorſum, et pellem revellat, nec patiatur corpori adhærere, quia id genus morbi maximè eſt armentis noxium. Columella, fol. 99.

[a] Propter fæturam hæc ſervare ſoleo, ante admiſſuram, menſem unum, ne cibo et potione ſe impleant, quòd exiſtimantur facilius macræ concipere: ſed tauri è contra impleantur duobus menſibus ante admiſſuram. Varro, lib. 2. fol. 58.

[b] A calendis Julii in calendas Novembris ſatientur fronde. Colum. lib. 6. cap. 3.

[c] Mas an fæmina ſit concepta ſignificat deſcenſu taurus cum iniit; ſiquidem, ſi mas eſt, in dexteriorem: ad idem Ariſtoteles.

[d] Altiſſimæ formæ, longæque, maximi uteri, frontibus latiſſimis, oculis nigris et patentibus, cornibus venuſtis, et levibus, et nigrantibus, piloſis auribus, compreſſis malis, palearibus et caudis ampliſſimis, ungulis modicis, et modicis cruribus. Col. lib. 6. cap. 21.

Age of a cow.

§. 6. In diſcourſe with a notable cow-keeper he ſaid, that he counted not a cow old till ſhe was eighteen or twenty years old, and that cows would very well live ſo long, though but few, as he believed, kept them beyond twelve, or thereabouts; they would not abate of their milk till they came to be very old.

But another of the ſame profeſſion replied, if a cow be kept above eight years old, though ſhe might give good milk without abatement, yet ſhe would be worth nothing for fatting, ſhe would be tough; and that ſhe muſt be helped up, when ſhe was down, unleſs ſhe were very well fed; he alſo ſaid, that many young cows would take a trick of not riſing of themſelves, but of lying, when down, till they were helped up.

Varro, lib. 2. De re ruſtica, c. 3. fo. 51. ſays, a cow is not good for breeding after ſhe is ten year old.

Known by the horns.

The age of a cow, after ſhe is three year old, may certainly be diſcovered; for every year after that age at the root of her horn ſhe will put forth a rundle, like a curled ring: on examination I ſaw an inſtance of it in one of my own cows.

And the teeth.

An old cow alſo will loſe her fore teeth in her lower jaw, and, if you ſhould buy ſuch a cow for the ſake of a good calf by her ſide, and believing ſhe may give good milk, if ſhe has loſt a tooth before, you muſt not think of keeping her above a year or two at moſt, but muſt fat her off. If a cow be pot-bellied, it is a certain ſign ſhe is old.

Age, when a cow is in perfection.

§. 7. The farmers of the Iſle of Wight agree, that a cow is not in perfection for giving the moſt milk till ſhe is ſix year old, and that it is common in that country, where a perſon rents land of one landlord, and cows of another, to give ten ſhillings a year rent for a grown cow; but as for a heifer of the third year, which is the firſt year of her giving milk, you may have her milk for her keeping, and though ſhe may the next year let for ten ſhillings, yet ſhe will not give ſo much milk then as ſhe will do afterwards.

Caution—not to keep a cow beyond ſix years old in the hill-country.

§. 8. I was telling farmer William Sartain, and farmer Iſles, my tenants in Wiltſhire, the cold winters in the hill-country fell ſo hard on old cows with calf, they being long kept to ſtraw, which is with us ſourer than ordinary, that I was reſolved I would not keep a cow to the pail for the future beyond ſix year old;—they agreed, that I was much in the right of it.—Farmer Iſles ſaid, the keeping cows ſo long and hard to ſtraw, and having but little rowet for them, was the occaſion of their running out ſo much to be pot-bellied, as they uſually do.

And I am ſince confirmed by experience, that in cold hill-country air, where the ſtraw is alſo coarſe, by reaſon of the cold land it was produced from, cows ſhould not be kept till they are old, but be ſold off at ſix, or ſeven years old at fartheſt; becauſe ſuch cows, after that age, and in ſuch a place, will pitch much at the end of the winter, eſpecially after calving time, nor will they pick up their fleſh again before ſummer is far gone, whereas young cows will bear the hardſhips of winter with ſour fodder much better than old cows.

§. 9. Mr.

Signs of a free martin.

§. 9. Mr. Biſſy coming to ſee me, and looking out into the backſide, told me immediately, that I had a free martin.—I aſked him how he knew a free martin from a cow; he ſaid, very well, it being eaſy to be ſeen; for, ſaid he, the bearing of a martin gathers up more like a purſe, and is not ſo firm and turgid as that of a cow; her head alſo is coarſer, and opener horned, like an ox, neither has ſhe ſuch an udder as an heifer not with calf, but a ſmaller.—He ſaid, the meat of a free martin, if well fatted, would yield an halfpenny in the pound more than cow-beef would do.

Free martin known to the Romans.

Amongſt the cows the Romans knew that there were ſuch as we call free martins, which they called tauræ, and ſuch they yoked with oxen. Columella, lib. 5. fo. 166.

A free martin is a ſort of a barren cow, which hardly carries any teats to be ſeen; ſhe will never take bull; ſhe fats very kindly, and in fatting ſhe'll grow almoſt as big as an ox; ſhe is counted eſpecial meat. When a cow brings two calves, a cow-calf and a bull-calf, the cow-calf will be a free martin, and will never bear a calf; but I believe the bull-calf is not affected in the like manner, but will propagate his ſpecies as other bulls.

Signs of a barren heifer.

§. 10. Mr. Biſſy, laying his hand on an heifer, ſaid, ſhe was barren; I aſked him how he knew that; he ſaid, very eaſily; for, ſaid he, when a cow has not taken bull, or not gone through, her bearing will be firm, and turgid, whereas, after ſhe has taken bull, and proves with calf, her bearing ſhrinks, and grows lank, and then again, about two months before her calving, it grows turgid; but this fulneſs of your heifer's bearing cannot proceed from her being ſo forward with calf, becauſe ſhe looks lank, nor can I feel any calf; for he felt her; and, ſaid he, if we graziers knew not theſe things, we ſhould ſuffer much.

Why the Lancaſhire breed degenerate in Leiceſterſhire.

§. 11. Captain Tate of —— near Loughborough, obſerved to me (anno 1706) that, notwithſtanding the Leiceſterſhire land was richer than that of Lancaſhire, yet they could not keep up the Lancaſhire breed of cows and calves they bought of them, but they would degenerate ſo, that in the third deſcent they had their Leiceſterſhire breed again.—He could not tell me the reaſon of it, but the next day meeting with Mr. Clerk, he ſaid, he conceived the reaſon to be, becauſe they in Leiceſterſhire were not ſo choice in the breeding, and managing of them as the dairy-men in Lancaſhire were; for, ſaid he, in Lancaſhire I have known them give eight, or ten pound for a bull-calf of a year old, which ſhall then be in his prime, and large enough for bulling the cows, but will decline and grow worſe at two years old; then, to make their calves large, they wean them with unſkimmed cow's-milk, whereas we in Leiceſterſhire give them ſkimmed-milk and whey, after their having had new-milk a month, and this regimen it is that ſo much improves the Lancaſhire breed beyond ours.

I aſked the abovesaid Mr. Clerk why the dairy-men in Leiceſterſhire did not prove as good huſbands, and order their cows as well as thoſe in Lancaſhire did; he ſaid, it would not pay, nor be worth while; for their land was better than that of Lancaſhire, and turned to a better account in breeding coach-horſes and mares, and fatting of cattle, and they kept but ſmall dairies, and therefore it would not be worth their while, where they milked but a few cows, to go to ſuch a price for a bull.—He ſaid, they obſerved farther, that their large breed of coach-horſes, if carried into Yorkſhire, would degenerate and grow ſmall, and if the pad, and ſaddle-breed of Yorkſhire, were brought into Leiceſterſhire to breed, they degenerate into a fleſhy heavy-limbed ſort of horſes.

Our hill-country farmers and dames are of opinion, that weanling-calves, or yearlings, brought out of the vale, do well in the hill-country; for they are no otherwiſe kept than they ought to have been in the vale, that is, wintered with hay; but it is true, cows from the vale do not do well when they come to the hills.

Of knowing and buying in heifers forward with calf.

§. 12. Being in company with farmer White of Catmore in Berkſhire, and farmer Crapp of Aſhmonſworth, Hants, I was ſaying, that I had winter-feed, eſpecially rowet, for more beaſts than I had, and did therefore intend, about Chriſtmaſs, to buy in beaſts of a year and an half old.—No, ſaid farmer White, I would adviſe you to buy heifers forward with calf, and, as you have rowet, you may keep them the better, and in all likelihood they'll fetch a good price in the ſpring; for laſt ſummer (anno 1701) was ſo dry, that abundance of calves either went through, or will come in late; therefore a forward heifer muſt yield a good price;—and you will not fail in having them that are forward with calf at Chriſtmaſs; if you go behind them, and draw their teats, and, if milk comes, they are for your purpoſe.

Cheats uſed in fairs.

§. 13. I aſked a notable Wiltſhire dairy-man, if it was not a frequent practice to fill the calf's belly with milk the morning they drove the cow and calf to a fair, to be ſold, in order to make the cow's udder appear full all day, and whether they had not a way, by drawing a ſtring through the calf's noſtrils, and tying it in the roof of the mouth, to keep the calf from ſucking; he ſaid, ſome did practiſe theſe things, but he never did; nor would he ever buy a cow in a fair, if her milk ſeemed to be pent up in her udder, nor where no ſign of the calf's having ſucked that day could be diſcovered; for in ſuch caſe he ſhould ſuſpect ſome cheat; nor did he ever ſerve a cow or calf as aboveſaid, and yet never found but they went off as well as other people's, who might uſe ſuch arts.—He ſaid, they had alſo a way of beſmearing the cow's teats with cow-dung, and then the calf would not ſuck, and in driving the cow to the fair her udder would be ſo dirty, and duſty, that it would not be ſeen.

Caution—not to let cows to hire.

§. 14. I would never adviſe any man to let his cows; for it never gives any content to either ſide, and the tenant will in all likelihood be negligent in letting the cow take bull that he may milk her the longer; for if ſhe be not with calf, ſhe will give milk all the winter in good plenty, and, when ſpring comes, he cares not; for he knows ſhe muſt be changed off.

Of fatting cows at London.

§. 15. A perſon who lives in Moorfields, near to the cow-keepers and renters there, and ſays, he is acquainted amongſt them, tells me, that the cows are fed with ſuch foul and rank food, that it rots them in the ſpace of two years, or two and an half at moſt, and the cow-keeper's practice is of courſe to put them away fat by ſuch time, leſt they ſhould be found dead on a ſudden. They are ſoon fatted, being good meat all the time they are milked; the food they give them is grains, cabbage-leaves, and bean-ſhells, of which laſt their milk will taſte ſtrong during the ſeaſon.

A cow or calf wellſummered is half wintered.

§. 16. I was ſenſible this year (1718) that a cow well ſummered is, as the ſaying is, half wintered; for this ſummer was two years I weaned twenty calves; that ſummer being wet, there was conſequently plenty of graſs, and thoſe calves were very luſty againſt winter, and eat their ſtraw, and throve very well all winter with ſtraw, and the advantage of running in my wood; but, on the contrary, this laſt ſummer being very dry, and graſs running ſhort, my weaned calves, eleven in number, were pinched before winter, and ſo came but poor to their ſtraw, the conſequence of which was, they never eat their ſtraw well, nor did they care to abide in the coppice to pick on the brier-leaves as the former calves uſed to do; ſo five of the eleven dropped off in the winter by the wood-evil, and the other ſix I was forced to take to hay by the middle of February, and could hardly preſerve them, nor could I thereby raiſe them but very little by the middle of April.

A cow after calving eats much more than before.

§. 17. I aſked farmer Chivers of Gauſun in Wilts, how much hay he conſumed in a year; he ſaid, above ſixty ton;—I thought that was a great quantity for his ſtock; he replied, his was a dairy of cows, and that, when they had calved, they would eat a prodigious quantity of hay.—Why, ſaid I, have cows when they have calved greater ſtomachs than before? Yes, ſaid he, a cow when ſhe has a calf to maintain, and is alſo milked, will eat as much as two other cows; a cow in that caſe will eat as much as an ox.

Id. a milch-cow in winter.

Many other farmers agreed, that a milch-cow would in winter eat as much hay as a fatting-ox; for, ſaid they, the drain from milking her is ſo great, that it keeps her up to a great ſtomach.

French-graſs in ſpring not equal to broad-clover for cows, &c.

§. 18. The ſpring (anno 1714) proving ſo cold and dry, that I could have no proſpect of mowing a good ſwarth in the French-graſs, about the 24th of May, I put in my working oxen, and milch-cows to feed it down, it being, as I thought, a noble bite for them; but we ſoon found, that the cows yielded leſs milk than when they went in the broad-clover, nor did the oxen fill themſelves ſo well as to be able to go through with their work, and ſo my oxhind feared.

Vetches, &c. a cordial to cows after calving.

§. 19. Being at Pomeroy in Wilts, and ſeeing farmer Stephens had ſowed vetches, I aſked him, why he had done ſo; he ſaid, they were excellent good to give his cows that calved in winter, or early in the ſpring; for ſuch cows would often be chilled in their calving in cold weather, and ſuch meat would be a cordial to them; he had had, he ſaid, cows take ſuch colds in their calving, that their bones would be ſore a great while after, ſo that they would not be able to ſet a leg forward; in ſuch caſe he made a great toaſt for them, and put it into two quarts of ſtrong ale, and gave it them, repeating it two or three times, and found it did a great deal of good.

Id. rough barley.

The country-men generally agree, that to give a cow rough barley when ſhe has calved, is very helpful to the bringing away the cleaning.—Quære, whether the reaſon muſt not be, becauſe it is a heartener, and a ſtrengthener, and that the cleaning ſtays behind by reaſon of lowneſs in the cow.

When cows calve, eſpecially if they have had any hurt, or are in poverty, the cleaning often does not come away well, but will hang down, and if it be neglected, and the cow has not in a day or two a drench to bring it away, by heaving and ſtraining to bring it away, ſhe will fall into the running of the reins, which will come from her like the white of an egg; this will much daunt the cow, and ſink her ſo, that ſhe will not ſoon get her fleſh again. To prevent this, and to bring away the cleaning, I have known it a common practice to give her a handful or two of miſsletoe; to which purpoſe Mr. Ray alſo obſerves, vol. 2. fol 1584. Commanducatæ fruticis frondes, & depaſtæ à jumentis & vaccis à ruſticis noſtris ad ſecundas remorantes ejiciendas utiles cenſentur.

In the hill-country let the cows go dry before you fodder them in winter.

§. 20. In the hill-country, where the winter proviſion for the cows is but ordinary, it is certainly beſt to let them go dry when they go to winter-fodder, or rather a little before that time, that they may be dry againſt they go to fodder, and then you ſhould alſo contrive as much as you can, to fodder them where they may have rowet:—this is the way to keep them in caſe all the winter, and to hold up your cows to a good body, and to bring them to the pail in ſpring with good udders, and to ſupport a good breed of calves: by being let to go thus early dry they will be better able to walk a field at ſome diſtance, where rowet may be had, or, if you have conveniency of foddering at a diſtance, they may abide where the rowet is to be had.

Give cows long fodder in wet weather.

§. 21. The rule is not to give the ſhort fodder in wet weather, becauſe the cattle will be more apt to waſte it and trample it under foot, than they will that which is longer.

A cow-houſe not equal to a backſide for foddering.

§. 22. Cows that are tied up in a cow-houſe never look ſo well, nor are in ſo good caſe as thoſe that are foddered in a backſide; for they want the airings, nor will they prove; tho' it is poſſible they may require leſs meat, as all unhealthy creatures do.

Of cows licking themſelves.

§. 23. I aſked farmer Lake, what was the reaſon that it harmed a fat beaſt to lick himſelf; Mr. Bachelour of Aſhmonſworth was then in company, and they both ſaid, that where a fat cow licked, it would make a jelly in the place, under the ſkin.-- And, ſaid farmer Lake, ſuch cows do not begin to lick themſelves till they begin to pitch, and ſink by faring hard; therefore the butchers care not to meddle with ſuch cattle; for where they have licked the tongue leaves a mark, and the butchers can eaſily ſee it.—-I ſuppoſe when they begin to pitch they begin to itch, which is the reaſon of their licking.

Of a cow's going to bull.

§. 24. It was May the 11th (anno 1702) when ſome farmers, good judges of cattle, were looking on my calves, which were then yearlings, and they being in a luſty condition, the farmers ſaid, if I did not keep them from the bull, they would take bull by Midſummer, which would ſpoil their growth.

They ſaid farther, that cows would take bull the ſooner for a bull's going with them, meaning, that if cows were luſty, they would take bull in three or four days time, if a bull were put to them, though otherwiſe their deſire would not come ſo ſoon.

One of them ſaid, for the hill-country cows that were ſmall, a young bull of but a year old, and a ſmall one, was beſt.—He had, he aſſured us, a luſty cow ſpoiled by a three year old bull, which flung the cow in the cow-barton amongſt the dung, and put out her hip.

In the beginning of October (anno 1703) I obſerved a cow, that had gone through her bulling, riding my other cows; coming to Holt, and being afraid ſhe might prove troubleſome to my cows with calf in the foddering-yard, I aſked Stephens of Pomeroy, if ſhe would be for bulling every three weeks in winter, as well as in ſummer; he ſaid, no; ſhe might not be for bulling above once or twice in the winter, becauſe it was winter.--But, ſaid he, if a cow goes thro' in the ſummer, and is apt not to ſtand to her bull, if immediately after ſhe is bulled you take about a pint of blood from the rump-vein of the tail, it will make her ſtand to her bulling:—and further, ſaid he, if you would have all your cows come in well together, you muſt milk a cow while ſhe is bulling, and give each of the other cows that you would have take bull a pint, or a quart of the bulling-cow's milk, and they will in two or three days take bull. —Another ſaid, that ſpatling-poppy would do the ſame thing: I had a maid, ſaid he, lately uſed to the dairy-countries, who, when I had a cow not apt to take bull, went into the grounds, and gathered a large handful of ſpatling-poppy, and held it to the cow, and ſhe eating it readily went to bull in two days after, and this, ſhe ſaid, in their country ſeldom failed.

Mr. Wiltſhire of Road coming to Holt while I was there, I had ſome diſcourſe with him about cows; it was in January (anno 1698); he ſaid, he had one that had gone through this year;—I aſked him, how that came to paſs; he ſaid, he ſuffered her to take bull at a year and a quarter old, letting her go on Road-common, where there were young bulls of that age; ſo ſhe brought him a calf at two years old, and, when they calve ſo young, they uſually go through the year following[e].—I wondered much that a cow ſhould calve ſo young;—upon which he ſaid, down in Somerſetſhire they uſed commonly to let their young cows, where they were well maintained, take bull at a year and a quarter old.—The ſame day farmer Pain ſhewed me two fine heifers with calf, that took bull at a year and a quarter old, but it was by accident and againſt his will, the bull breaking looſe to them.—He ſaid, what Wiltſhire obſerved of ſuch heifers going through the next year might be very likely in their poor keeping, but would not ſo likely fall out if they were well kept.

Farmer Stephens, and farmer Chivers ſay, unleſs the keeping be choice good, (ſuch as Gauſuns near Bradford-Wilts) it is by no means proper to aim to have calves to come at Candlemaſs, nor to let yearlings take bull at Midſummer; it utterly ſpoils their growth;—nor does Stephens like, that his heifers at Pomeroy ſhould take bull till two year old.--Yet they ſay, that ſometimes, if they are very well kept, though not often, heifers will take bull at a year old, that is to ſay, at the beginning of May, though regularly they will not take bull till towards Midſummer; but this is to be underſtood of ſuch as were calved about Candlemaſs, there being almoſt a year's advantage gained over them that were not calved till May-day.

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[e] Sir Ambroſe Phillipps's ſhepherd ſays the ſame with farmer Wiltſhire.

I was telling a great Somerſetſhire dairy-man of a heifer I fatted, which from Midſummer to March would never ſtand to her bulling, nor did ſhe riſe in fleſh, fit for killing, by March, though ſhe had corn with her hay moſt of the winter.—The farmer ſaid, he had had ſuch heifers, and that they never would fat inwardly: as ſoon as one finds them take to that trick it is beſt to ſell them off.

I was ſaying to Mr. Clerk of Ditchley in Leiceſterſhire, that I had heard ſome farmers ſay, that, though a cow, which never had been with calf, would not fat kindly till ſhe had been bulled, and was with calf, yet a cow that had once had a calf would take fat well enough, though neither bulled, nor with calf.—To which he ſaid, that the latter might prove better than the former, but nevertheleſs the latter would not come forward, nor prove any thing ſo well before as ſhe would do after ſhe had taken bull, and was with calf, but would every three weeks be on the fret, and run about chafing herſelf; and loſe as much fleſh in the day or two ſhe was for bulling as ſhe had got in three weeks before.—He ſays, if one buys in, what we call, barren beaſts, to fat, they will require, and take bull as ſoon as they grow a little in proof.

Id. and of keeping a bull to go always with the cows.

§. 25. I have found by experience, that thoſe who keep ploughing, and fatting-oxen, as I do, ought always to have a bull to go with the cows, to keep the oxen from riding them; for otherwiſe it is impoſſible to keep them ſeparate; for the oxen will break over hedge and ditch after the bulling-cows.—The beſt way, in order for this end, is to buy a fine bull-calf from North-Wiltſhire every year, and then you'll always have a bull of two years old, and a bull-calf, which will come up yearly for uſe, one year after the other; and the bull will be ſo maſter over the oxen that the cows and oxen may go together without inconveniency; nay, it is a good way to have a bull go with cows, if it were on no other account than to prevent the other cows from riding thoſe which were for going to bull.

Oxen ſhould be kept ſeparate from cows in ſummer.

§. 26. It ſeems to me, that in the ſpring of the year, and throughout the ſummer, till the barren cows have taken bull, the oxen ought to be ſeparated from the cows, both at graſs, and in diſtinct foddering-yards, becauſe the oxen will be riding the heifers, and ſtraining them, as well as beat out themſelves.

There are often many damages and loſſes, which fall out in the way of huſbandry, to rectify which, it may be, it is inconvenient at that preſent time, and ſo one bears with them; whereas it is ten to one but we ſhall be much more incommoded in conſequence, for want of rectifying at firſt the firſt damage or loſs.—An hundred inſtances of this nature might be given; a cow, for inſtance, wants to take bull, and it may be, at the firſt approach of the ſpring, you are not provided with a bull, and it being a buſy time, it would very likely be a ſmall inconveniency for you to ſpare a perſon to drive this cow to a neighbour's bull, perhaps a mile, or two off; but this inconveniency of the two is generally the leaſt; for, by not doing ſo, your oxen, if you keep any, will break out after this cow, and teach others to do the ſame, which they will hold to ever after, to a great inconveniency to your corn, &c. And it is almoſt incredible how even oxen in a diſtant ground will ſnuff up the effluvium of a cow going to bull, and break over hedges after her.

To know when a cow is with calf.

§. 27. As I was ſhewing a cow to a butcher, this cow, ſaid he, is with calf.—I aſked him how he knew; he ſaid, very eaſily; when a cow is twenty weeks gone with calf, if one went to the right ſide of the cow, and preſſed hard againſt the flank with one's hand, and did it with a ſwift motion, one might feel the calf knock againſt one's hand, of the bigneſs of a ball; till the calf be twenty weeks old, or thereabouts, it lies up high under the flank, but then, as it grows bigger, it falls down lower, and then one muſt feel lower for it; and when there is another perſon on the other ſide of the cow, and he ſhoves the flank on his ſide towards you, it will help the perceiving it, when ſhe is but very young; and ſo the graziers, by the hardneſs and bigneſs of the calf they ſo feel, judge how far the cow is gone.

Id. and how far gone.

Two underſtanding farmers were with me, viewing my beaſts, and they obſerved a heifer's udder to ſpring much; whereupon my bailiff ſaid, ſhe would calve in a day or two; —but the farmers ſaid, it might be a week firſt; for a heifer will ſpring fuller in her udder, and for a longer time before calving than a cow.

William Sartain, an experienced farmer of Broughton in Wilts, aſſures me, a heifer will not, when ſhe is half gone, ſo eaſily diſcover herſelf to be with calf as an elderly cow will, becauſe the ſides of an elderly cow fall in more; in judging of an heifer one may often be miſtaken.—He ſays, when a cow is half gone, the graziers reckon that the calf preys on the cow, and that ſhe waſtes; not but that a cow may be fat in fleſh, and very fit to kill, within three weeks or a month of her time; but in that caſe, withinſide, and in her ſuet, ſhe will be much impaired;—and one in the company added, her fleſh, though fat, would not in that caſe ſpend ſo well; to which William Sartain agreed, and ſaid, undoubtedly it would not eat ſo juicy as the fleſh of a cow but half gone.

Of cows over-laying themſelves.

§. 28. In January (anno 1700) I was diſpleaſed to ſee the damage the farmer's hogs did me, in roading about, and told him, I would have them penned up in his foddering-yard.—My dame replied, if ſo ſhe muſt ſell them; for they muſt not come into the foddering-yard amongſt the beaſts;—I aſked her why; ſhe ſaid, it would endanger the cows, being big with calf, over-laying themſelves; for, ſaid ſhe, the hogs would nuzzel, and make holes in the ſtraw, and the cows lying down in ſuch hollows might die before morning, becauſe they could not riſe.—The farmer ſaid it was very true.—And I obſerved, that tho' no pigs came there, they took care every night to lay the ſtraw ſmooth.—I ſpoke of it afterwards to Mr. Edwards, and he was well apprized of the truth of it.

If a cow be tied up in the houſe, great care ought to be taken, when her calving time draws near, to watch her by day and by night, leſt her calf ſhould be drowned; for, the cow's head being tied to the rack, ſhe cannot turn back to lick the calf; beſides ſhe may calve in her dung, and ſo the calf may be ſmothered.

Management of a heifer with calf.

§. 29. If a young heifer be pretty forward with calf, that is, ready to come the beginning of July, and graſs ſhould be like to be plenty that year, it may ſometimes do well to let her go on, and calve; ſhe may pay better to the dairy than to ſell to the butcher; but, in caſe it ſhould be like to be a ſcarce ſummer for graſs, ſhe muſt be heightened up in fat as faſt as may be, and be ſold to the butcher; otherwiſe ſhe may loſe all her keeping; for ſhe will fall away when ſhe comes near calving, and, in caſe ſhe calves, ſhe may yield no more than what ſhe coſt when bought in.—When a cow begins to come pretty forward with calf her teats will be turgent, and ſpring forth.

Of a cow's ſlinking.

Mr. Cherry of Shotſbroke's bailiff informs me, that to let a cow keep company with other cows, after ſhe has ſlunk her calf, will be apt to make ſome of the others ſlink alſo.

Not to milk a cow that has warped.

§. 30. It is dangerous truſting to milk a cow all the year that has warped, for ſhe will be in danger of warping again: ſometimes one may venture to milk on a very good young heifer, but it is generally very unſafe. It is generally beſt not to milk ſuch a cow; for that will keep her very poor, and unfit to ſell to the grazier; whereas, by letting her dry up, ſhe will be in the better caſe, and ſell the better, and pay more than ſhe would by milking.

Of cows warping, and going through.

§. 31. Mr. Godwin of Glouceſterſhire told me in January, anno 1698,—that he had had ill luck this year in his cows; for three had warped, and one gone through. The calves, he ſaid, were ſquatted, and one of their heads had a hole beaten into it, which he judged to have been done by his cow that went through; for it ſeems, it is the nature of a cow that goes through to deſire a bull once every three weeks after, and ſhe will then be riding the other cows, which another cow that has warped, or gone through, will like very well, but the cows with calf will ſlip away, and ſtep with their hinder quarters aſide from ſuch a cow's leaping them, and then it often happens, that ſuch a cow's knees fall againſt the ſide or flank of the cow with calf, and ſo ſquat the calf.

Stephens of Pomeroy being preſent agreed to the above; and ſaid, that he never had but one cow that warped in his life, and the reaſon why he had been ſo ſucceſsful, he believed, was, becauſe he never had a cow go through.—It ſeems, the deſire in a cow that goes through for a bull every three weeks generally laſts about twenty-four hours, but ſometimes it holds three days, during which time, Mr. Godwin ſaid, if he obſerved it, he tied her up.—I aſked Stephens, if he knew what made a cow apt to go through; he ſaid, he was ſatisfied it was for the moſt part from hence; if a cow ſhould come too early with calf, that is, before the huſbandman would have her ſo to be, and conſequently ſhould be deſirous very early to be bulled again, the huſbandbandman will balk that deſire two or three times together, that his cow may fall with calf at a more ſeaſonable time than otherwiſe ſhe would have done: after ſuch balks it is odds, ſaid he, but, when ſhe takes bull, ſhe goes through; and there is oftentimes a young heifer, that (in the year the farmer firſt deſires ſhe ſhould take bull, and the firſt time of the heifer's deſiring it in that year) when ſhe ſhall be brought to the bull, will be very ſkittiſh, and will not ſtand to be bulled; in that caſe, ſaid he, for fear of the foreſaid danger, I have taken the heifer by the noſe, and held her till ſhe was ſerved.—But, ſaid Godwin to Stephens, in caſe a cow be ſubject to go through, do you know how to prevent it? Stephens ſaid, after ſuch a cow has taken bull, to bleed her well in the tail is the beſt thing I know of.

If a cow caſts her calf, you muſt let part of her bag that will hang down behind continue ſo till it rots off; for if you pull it off, you will be apt, with it, to pull away what you ought not.—If you have a cow, that either warps her calf three months before her time (for if ſhe warps but a month before her time, ſhe may give milk never the worſe for it) or goes through on her bulling, never proving big with calf, diſcretion muſt be uſed, whether you will milk her on, or fat her; and this ought to be, according as the cow is like to prove well for the pail or not.——The dairymen think the aforeſaid bag that hangs down, the other cows ſmelling to it, is apt to make them warp alſo, as well as the warped cows riding the others.

They count a cow's warping her calf a month before her time not to be ſo bad as an ewe's loſing her lamb; for the calf when firſt weaned cannot be valued at above half a crown, and it robs afterwards more butter and cheeſe than quits coſts; whereas, a lamb will yield a crown after it has ſucked milk that otherwiſe would never have turned to any account.

A neigbour of mine had three cows that ſlunk their calves, and yet he could find no hurt in the cows, nor could imagine the meaning of it; a little time after paying a viſit to Mr. Dark of Beckington in Wilts, and ſpeaking of the accident, Mr. Dark aſked him, whether he had not rid ſome ponds or ditches that year, and ſpread the ſoil of them about; he ſaid, he had; why then, ſaid Mr. Dark, I have often heard ſay, that that will cauſe the cows to ſlink. This ſeemed ſtrange, but mentioning it afterwards to ſome of his workmen, they agreed, that they had before heard ſuch a ſaying.

I aſked Mr. Hawkins, an experienced grazier, if a three-year-old heifer, that had warped early, as ſuppoſe about January or February, would make ſound beef; he ſaid, not ſo good as one older would do, but ſhe would tallow the better for having warped ſo early.—I ſuppoſe a barren beaſt, for the ſame reaſon, will do ſo too.

§. 32. Mr. Biſſy ſaid, it was very common, at this time of year, about July, for a cow to die in calving.—I aſked, for what reaſon; he ſaid, at this time of the year their calving over-heated them, and, tho' they were like to do well, they muſt be kept from cold water, of which at this time they would be apt to drink a great quantity, and would die thereon preſently after;—and, when they

Cows apt to die in calving in July — Caution— to keep them from much water.

they are ſuffered to drink, they ought to have hay given them before they drink.—I aſked him, if drinking when they calved was not dangerous in the ſpring; he replied, the cow was not then ſo thirſty as to drink to harm herſelf; however, he took great care then to give them hay before he gave them water.

Caution— to give cows warm water, and but little at a time, when calving in in June or July.

§. 33. June the 12th (anno 1718) I walked out on Oxen-leaſe grounds in Wilts, with my tenants Tomkins, and farmer William Sartain, to ſee Tomkins's cattle; there was a cow that had not then calved, but Tomkins expected her to calve every day; ſhe was a fine large cow, and in mighty caſe, for ſhe was pretty good beef: farmer Sartain ſaid to Tomkins, he muſt have his eye to that cow when ſhe calved, and not let her have water for twenty-four hours after ſhe had calved, and when he did give her ſome, he muſt ſee that ſhe drank but a little, and that it was warmed.——I aſked why that care muſt be taken; he ſaid, when cows calve in ſummer, or hot and warm weather, there muſt be greater care taken of them than when they calve in the ſpring; for their bodies in hot weather will in calving be heated, and in that caſe the cow will be very craving after cold water, on drinking of which ſhe will take chill and die; therefore in ſuch caſe it is uſual to drive ſuch a cow to the houſe as ſoon as ſhe has calved, and not let her drink ſoon, and when ſhe does, but ſparingly, and of warm water, for about two days; and this cow, ſaid he, being in high caſe, will have the more need of ſuch regimen; for ſhe will in hot weather heat herſelf ſo much the more in calving.—I talked with farmer Chivers of Gauſuns about it the next day,—who ſaid, all this was true, and that his next neighbour loſt a cow a fortnight ago for want of ſuch care.

Of a bull-calf.

§. 34. It is commonly ſaid, that a bull-calf, as well as a pur-lamb, comes a week earlier than the females.

Of cows milk turning ſalt.

§. 35. Sir Ambroſe Phillipp's dairy-maid was adviſing with the butcher what ſhe ſhould do with a cow that fell off of her milk, and her milk grew very ſalt: no hurt was viſible in the cow, nor had ſhe got any cold.—I aſked him, if either of thoſe things would have occaſioned it; he ſaid, yes; he had known either to have been the cauſe of it, and particularly, when the late cold (anno 1699) ſo univerſally ſeized the horſes, the cows at Loughborough ſhared in it, and they fell off of their milk, and it turned ſalt, and this was in June, and the farmers ſuppoſed the milk would not come well again till the cow had had a calf.

To dry up a cow's milk.

§. 36. A butcher of Whitchurch in Hampſhire, being with me, took notice of an old cow ſo forward with calf in June (anno 1702) as to be within a month, the cow being alſo in good caſe; he ſaid, it was a pity, and adviſed however to dry up her udder as ſoon after ſhe had calved as the calf was a fortnight old.—He ſaid, when we went about it, we ſhould anoint the udder with tar, but not the teats, and half milk her two or three times before we let her go dry; he aſſured me, this was the method of the Somerſetſhire graziers,—and tar is a cooler, and a diſpeller of tumours.

In Derbyſhire, as ſome farmers of that country aſſured me, if a cow's milk does not dry up well after the cow is turned to fatting, by reaſon of the plenty of graſs, and puniſhes her, they give her a pint of verjuice at two or three days diſtance, which effectually does it.

Of milk, milking, &c.

§. 37. Being in company with Mr. Biſhop, and farmer Ryalls of Dorſetſhire, we fell into diſcourſe about milch-cattle, &c. Mr. Biſhop allowed me, that milk of cows was thicker in winter than in ſummer, but had not ſo much cream in it, but much of the ſubſtance of the milk cruddled on the top; that the milk, whilſt the cow was with calf, inclined towards bitterneſs and ſaltneſs.—He and Ryalls did agree, that, if cows were low in caſe, and eat only ſtraw, they would not give good milk till they calved, but it would fall to raggedneſs ſix or eight weeks before their calving-time; but, if the cows were in good caſe, and had good hay, they might give tolerable good milk till they calved; however they thought it was not adviſable, in either caſe, to milk them within two months or ten weeks of their calving; for that it did certainly impoveriſh both cow and calf much more than the value of the milk came to, nor would the cow come in ſo early and forward in the ſpring for her milk; they alſo agreed, that, whilſt creatures were young, as lambs and calves, they ſhould be well kept, and they would ſhift the better for it ever after; for ſuch a calf would, they ſaid, come in a year the ſooner for the pail; and they agreed, that, though Mr. Biſhop ſent his hog-lambs into Somerſetſhire for rich paſture from Michaelmaſs to Lady-day, and paid half a crown a-piece for keeping them, yet he was paid double fold for it.

In the months of May and June, ſay Mr. Biſſy and Mr. Pain of Wilts, a cow, in our good paſtures, ought to pay 3 s. per week in her milk, which rearing a calf till five or ſix weeks old will not do, ſo that about that time our butchers kill the calves, at a fortnight old, mere carrion; for ſuch calves will not pay us above 2 s. per week.

An heifer's calf better for rearing than a cow's calf.

§. 38. Mr. Maſerly was ſaying, it was agreed on all hands, that an heifer's calf was much better for rearing for breed than a cow's calf.——I replied, it was ſo, but I was at a loſs for what reaſon it ſhould be ſo;—he ſaid, he ſuppoſed, the only reaſon could be, becauſe the heifer could not be milked at the time ſhe went with calf, which robbing the calf in the cow's belly muſt needs do the calf a great prejudice.

Latter fallen calves not ſo hardy when cows as early fallen ones.

§. 39. My oxhind, who manages my ox-ploughs, and was for many years a farmer himſelf in the north-weſt of Wiltſhire, ſays, according to his experience, and the experience of other farmers in his country, the latter fallen calves, ſuppoſe in May and June, are never ſo hardy afterwards when they are cows, nor will they bear the winter ſo well when they are cows as thoſe reared from calves which fell at the latter end of February, or the beginning of March.—It ſeems to me, that the reaſon for this muſt be, becauſe the latter fallen calves muſt conſequently be weaned late, ſuppoſe, about Auguſt, and calves always pitch, and fall away on their firſt weaning, and then winter comes on ſuch late weaned calves before they have recovered their ſtrength; and again, ſuch calves not being ſo well eſtabliſhed in their vigor and ſtamina vitæ, nor having had that ſhare of the ſummer-ſun which early calves have, never do arrive to that ſtrength in their cords, and ligatures, and ſolids, as the early weaned calves do, and conſequently, being alſo when cows of a more tender nature, do ſuffer more in winter, nor can they ſo well bear the hardſhips of it as the others can.—He affirms farther, that ſuch late weaned calves when they come to be cows, will never ſhed their winter-coat ſo ſoon, by a conſiderable time, as the early weaned calves will,—and indeed this is very true; for I have now, being in the month of June (anno 1712) a yearling calf, which, though he fell in June, and, being a very fine one, I kept him, and let him run with the cows all the winter, and he out-grew the calves that fell in March, yet pretty much of his ruſſet winter-hairs are ſtill on his back; whereas the coats of the early weaned calves are ſleek and ſmooth.—He adds farther, that cows in a fair, in May or June, that have not ſhed all their winter-coats, are, in his country, as much concluded by knowing farmers to have been late fallen calves, as if they had ſeen them calved;— nevertheleſs I am ſenſible the occaſion of this may alſo often be from the poverty, and hard winter's-keeping of the cows.—I have alſo now three cows of my own breed, which have not yet (though the latter end of June) kindly and perfectly ſhed their winter-coats, and yet are very well in fleſh, which I believe to be from the aforeſaid reaſon; for though I do not certainly know that they were late calved, yet, becauſe of the coldneſs of our ſituation, and the ſcarcity of graſs and hay in the ſpring, we are forced to contrive the bulling of our cows ſo, that the calves may fall pretty late.—It is certain, that the earlieſt breed of the ſpring, of all kinds, are moſt valued, and the farmers find the aboveſaid account in them, as for inſtance, in colts, pigs, and lambs; the earlieſt are the moſt valuable, and to be endeavoured for, if the place will admit of it, and there be fit proviſions for them.—School-boys, by experience taught, greatly prefer the ſinging birds hatched in March to thoſe that come later, and it may be queſtioned, whether the early births of the ſpring may not have a ſpecial influence in regard to the vigor and ſtrength of mankind, but that the ſoul of man, and the affections thereof, and the ſtrange artful mixtures of food, under infinite noxious varieties interpoſing, exerciſe ſo vaſt and immediate a dominion over health, and in the well or ill diſpoſing the conſtituent parts of our bodies, that it is difficult to make the obſervation thereof; yet ſome little better judgment might be made in the wilder part of the Indies, where the ſavages conform themſelves more to the methods of mere animal life: I ſhould think the ſetting out on the race with the ſun, even in the laſt caſe, cannot but give ſome advantage.—Note, from hence it ſeems to me reaſonable, when we go to fairs early in the ſpring to buy barren beaſts for fatting, to buy thoſe that are ſleekeſt, i. e. have neareſt loſt their winter-coats, becauſe it ſeems they will thrive faſteſt.

I have taken notice, that calves late calved do not ſhed their coats ſo early in the ſpring, when they come to be cows, as thoſe cows do that were reared from calves calved early in the ſpring, and being willing to know the opinion of ſome of the notable dairy-men about Holt, I found moſt of them had made the ſame obſervation.—Thomas Miles added, that ſuch late-calved calves generally carried thick hides, and the reaſon he gave for it was, becauſe the cows, which calve about May, are by that time got into good fleſh and heart, and ſo nouriſh their calves the better; for which reaſon their hides are thicker. —Farmer Chivers ſaid, that, when ſuch cattle were not forward in ſhedding their coats, it was a ſign, that their ſtrength of nature was backward, and their blood cold, for that cattle's-blood in the winter, when they were out of proof, if they were let blood, was ſenſibly to the hand colder than in the ſpring, and colder in April than in May.

Note, there is, on the approaching ſpring, a certain degree of proof requiſite to give activity to the blood to go to the extremities of the capillary veſſels, in order to form new roots of young hairs, till which be done, the old ones ſtill continue their roots, and are not expelled.

Of giving calves hay at their firſt weaning.

§. 40. Farmer William Sartain ſays, about them in Wiltſhire the farmers geld the bull-calves at a month old, and then, in a week, or at fartheſt a fortnight's time, after they have recovered their being daunted by gelding, they wean them from the cows by giving them ſome locks of the ſweeteſt hay they can get, in ſome convenient place, where there is an outlet to graſs; and that the calves will delight to brouſe on the hay more than the graſs; and this they make them to do for a fortnight before they turn them wholly to graſs.—I aſked him for what reaſon they gave ſuch calves hay at their firſt weaning; he ſaid, to dry up the water in them, and to harden their bodies; otherwiſe, if they were at firſt turned wholly to graſs, it would be apt to ſcour them too much at firſt, and make them pitch;—but Farmer Chivers ſaid, on fat ground, ſuch as Gauſuns, they only wean the calves that fell about Candlemaſs at ſix weeks old, in order to their taking bull the next year, and then there is no graſs, yet they do very well on hay alone.

Of weaning calves.

§. 41. An experienced dairy-man in Somerſetſhire tells me, if you rear a calf, he rather approves of weaning him at ſix or ſeven days old, which may be done by warming the ſkimmed-milk for him, into which if you dip your finger, and put it into his mouth, he will ſuck, and then, if you put a little bundle of hay, and give it into his mouth, he will ſuck that, and ſo, if the hay be put into the pail, and his head thruſt to it, he will ſuck the bundle of hay in the milk, till he has drank it all up.—He ſays, he obſerves the calves weaned thus early to grow better, and make larger cattle than thoſe weaned at ſeven or eight weeks old; for then they will pitch very much upon their weaning: however this way is very good, when the cows are poor; for the milking of them will not draw them half ſo low as the calves ſucking will do.

Another, of great note in the ſame country, agreed, it was beſt to wean a calf early from the cow by giving him the milk out of the pail; for then he might run with the cows all ſummer; whereas, if he was ſuffered to ſuck the cow till he was five or ſix weeks old, he would be apt to ſuck her again after being weaned, eſpecially if the cow be any thing fond.

A new dairy-maid of mine (anno 1706) deſired ſhe might wean my calves at two or three days old, as ſoon as they could have drawn down the beeſtings; for ſhe ſaid, they would not be ſo apt to ſuck one another.—I note this the rather, becauſe we uſed before to keep them long with the cow, and they uſed to ſuck one another.

Being in the Iſle of Wight (in Auguſt, anno 1708) I aſked my tenant farmer Farthing and his wife (that farm depending much on breeding cattle, and conſequently in weaning calves) how they weaned calves; for ſome years I had found ill ſucceſs in truſting to the ſervants weaning of calves; ſome of them by ill and ſour diet, for want of their keeping their troughs ſweet, grew louſy; others fell into diſeaſes by being over-fed; I found by them, that, amongſt other things, they gave a rule to their ſervants, in the meaſure of feeding, in this manner, viz. they ordered every calf to be fed by it's ſelf, in a bucket, by a preſcribed quantity; viz. they gave three pints to a calf on it's firſt weaning, and advanced it gradually, as the calf grew, to five pints, as the calf was able to take it, before being turned grazier for itſelf, and this was the largeſt quantity they ever gave one calf in a day.—They fed every calf at a ſeparate bucket; for they found many inconveniencies in feeding them together; ſome calves having a greater ſtomach, or being quicker feeders than others, would eat too much, and the ſlower feeders would ſuffer, and have too little.

I had a mind to know dame Farthing's opinion of weaning the calves by letting them run with the cows rather than ſuckling them by hand: ſhe ſaid, if they took their weaning by running with the cows, they would not be ſo gentle, nor ſtand ſo well to the pail, as the others.

Farmer Stephens, farmer Box, and all the farmers at Holt agree, that it is a very good way to give weaned calves, when firſt turned out to graſs, ſkimmed milk, morning and evening, in troughs, for ſome time, but ſay, in their country they cannot afford it, becauſe of making cheeſe of the ſkimmed milk, and their hogs muſt have the whey.

Being at Holt the 23d of May (anno 1719) I went to Pomeroy, where farmer Stephens had a calf of but a month old, which he intended then to turn to graſs.—I aſked him, if he was not too young to eat graſs, and live on it, he ſaid, no; they would take their weaning as early as that, but calves uſually fell ſo early in the year, that there was no graſs, but at this time of the year there is graſs and leaves every where for them to pick on, upon which account they might now as well wean a calf at a month old, as in March at ſix or ſeven weeks old.

If in weaning calves the graſs be apt to ſcour them, putting a little ſalt in their milk will be a means to put a ſtop to it.

Of calves ſucking each other.

§. 42. I ſaw two half-yearling calves of mine in December (anno 1701) ſucking one another for a long time together; two Glouceſterſhire yeomen being with me, they ſaid, that tar muſt be put to their teats, to prevent it; for otherwiſe in their country they look on it, that ſuch calves will, when cows, get a trick of ſucking themſelves or each other.

§. 43.

§. 43. In taking a view of my lambs to ſee if they were meat for the butcher, my ſhepherd caught a fat lamb by the tail, for which a butcher of Whitchurch chid him; but the prejudice thereby I knew not, till my butcher the market-day after told me I had ſpoiled a calf by halling him by the tail, whereby his kidneys were very red, and his loins ſtrained, by which his thriving was ſpoiled; he ſaid it was the worſt thing that could be done to a calf at his ſucking-time to hall him about by the tail, or any other creature whatſoever, for the reaſons aboveſaid.

Damage from pulling a calf or lamb by the tail.

§. 44. In Hertfordſhire and Eſſex the calves-coops are ſet ſo that the ſun may come as little at them as can be. From J. Mortimer, Eſq. F. R. S. fo. 169.

Of calves-coops.

§. 45. If calves and lambs cannot be well ſupported for the two firſt months in a kind way of fatting, it is hard to make them fat, but they being ſtunted at firſt will be pot-bellied.

Calves ſtunted.

§. 46. Farmer Stephens of Pomeroy in Wilts tells me, (September 1712) it is now the practice of the butchers all over the country to buy the calves, or agree for them as ſoon as weaned, and to come when they are about nine days old, and bleed them in the neck, taking the quantity of about half a pint, and to come three or four days after, and bleed them again the ſame quantity, and a third time the butcher comes three or four days after that, and bleeds them a pint. Note, he is ſure a pint is the leaſt quantity they take from them the laſt bleeding; he rather believes it is a quart.

Of bleeding calves.

Mr. Perdue of Wincheſter has had good ſkill in fatting calves, and the butchers would prefer a calf of his beyond any others.—He ſays, he uſed, according as his calf was luſty, at about a fortnight old to take from him about a pint of blood, and about a fortnight after another pint; he uſed to bleed them in the neck-vein;—he ſays, he placed their pens ſo hollow from the ground that their piſs might run through and off, but never uſed to remove their litter, but every day give them a ſprinkling of freſh wheat-ſtraw over their old bed; by this means, ſaid he, the calf lies clean and dry, and much warmer than otherwiſe it would do, for, ſaid he, a calf can't lie too warm, and the heat of the dung, fermenting under the ſtraw, will much contribute to warmth.

§. 47. The method of the houſwives in Leiceſterſhire, if a cow gives but little milk, ſo that the calf is not well maintained, is to ſcald bean-flour and put it into the milk: giving them this milk very hot they think much contributes to the whitening the veal, as the bean-flour does to the fatting: you muſt give it them hotter and hotter by degrees, at firſt lukewarm, till at length they will be able to drink it as hot as you can endure your finger in it.

Of milk and bean-flour to fatten calves and whiten veal.

§. 48. I was commending the goodneſs of my veal to a great dairy-man, and ſaid it was of a calf two months old. Then, anſwered he, the calf muſt be a cow-calf, for otherwiſe it would eat ſtrong at that age; the caſe is the ſame with a ſucking-pig; a ſow-pig will eat well at a month old, but a boar-pig at that age will eat ſtrong.

A cow-calf may be killed older than a bull-calf.

No white veal of a calf leſs than a month old.

§. 49. Sir Ambroſe Phillipps's keeper ſays, that veal cannot be white till after a calf be a month old; for till that time a calf does not begin to be white in his fleſh.

Time of foddering calves in the winter.

§. 50. If yearlings or calves are ſo well provided in winter-time with rowet, which they can come at, that they need be foddered but once in the day, that time had beſt be early in the morning; becauſe there is uſually a hoar-rime on the graſs, till the ſun riſes to melt it, whereas the reſt of the day the feeding on the rowet is very good till evening.

Diſeaſes in COWS and CALVES.

A moiſt noſe a ſign of cattle's being well.

§. 1. MR. Smith of Deadhouſe in Wilts, walking with me at Gauſuns, a poor woman came forth, and aſked him, what he thought of a cow ſhe believed to be ill; he ſaid, he thought the cow was not ill, becauſe her noſe was moiſt, and that, if a cow or a beaſt be ill, that moiſture preſently dries up; Mr. Biſſy ſaid, ſo it was obſerved alſo in the yellows, and red-water, which, it ſeems, are only a higher degree of the black-water.

Of bleeding cattle before grazing.

§. 2. I aſked Mr. Clerk of Leiceſterſhire, whether he uſed to let his beaſts blood that he bought in for grazing; he anſwered, it was not only a ſafe way, but they would alſo thereby thrive the better; he ſaid, if oxen bought in had been hard worked, or cows hard drove, it was very proper to let out their corrupt blood, if it was only on that account, after they had been a week or a fortnight ſettled to graſs; beſides, as to other cattle, it was very well to bleed them when they firſt came into proof, leſt they ſhould overflow with blood: it is, he ſaid, the ſame alſo with horſes.

Of the murrain.

§. 3. I met Mr. Putchin, a great grazier, and a country-fellow, who lamented he had loſt a cow of the murrain: we fell into diſcourſe about the murrain, and they both agreed, that in ſuch a caſe it was very neceſſary to bury the beaſt that died preſently upon the ſpot, by digging a hole for it cloſe thereto, and to drive beaſts away out of the ground, and keep them from ſmelling to it, for, whilſt it was above ground, they would be apt, if they could come at it, to ſmell to a dead beaſt; and, to prevent the reſt from having the diſtemper, they rubbed their noſtrils with tar, and daubed an egg over with tar and thruſt it down their throats.—Sir Ambroſe Phillipps's ſhepherd agreed to all this, only ſaid, he blooded them alſo.

Of the joint-murrain, or

§. 4. In the month of November (anno 1707) I loſt two calves by putting them into young freſh broad-clover that was groſs, and of this year's ſtubble.—They call the diſtemper the joint-murrain; farmer Munday, who lives by Aldern-Mead, Hants, ſays, it is common for calves to die ſo in the vale,—but it is not ſo on our hills.—The calves muſt be bled in the jugular-vein, a pint of blood, and be drenched with it, with a handful of ſalt mixed with the blood.

Quarter-evil.

The joint-murrain in calves, mentioned above in 1707, I find by others is called the quarter-evil; I find by farmer Stephens of Pomeroy, it falls on yearlings and two-yearlings at ſpring, and autumn, that is, October, and it ſeems to me to be owing to the quick riſing of graſs at thoſe ſeaſons, eſpecially where, through the goodneſs or moiſture of the ground, it grows faſter than the ſun can concoct it's juices, which chill and coagulate the blood in thoſe cattle, and occaſion a ſettled jelly in the neck, ſhoulder, or loins. The ſaid farmer approves the medicine above preſcribed, but ſays, he has found by experience, that an egg-ſhell filled with tar, and minced rue, and with a ſtick thruſt down the throat (with blood-letting) is the beſt remedy; he ſays, to prevent this miſchief, he has always found it beſt to let the yearlings and two-yearlings go with the cows, eſpecially at ſuch times of the year.—The reaſon for which I conceive to be, that the cows eat up the groſſer graſs, and thereby the calves feed the ſweeter.—I find by him, that he never knew milch-kine to have the quarter-evil, for which this account, I think, may be given, viz. the morbifick matter is diſcharged by the cows with calf in the foulneſs of their urine.

Of the blain. Vid. Diſeaſes in ſheep.

§. 5. In diſcourſe with my old ſhepherd, in July anno 1697, (who ſays, he has been a ſhepherd ever ſince he was ten years old) about the blain, he ſaid, it fell on the cattle only at the ſpring of the year, and was over before the latter end of July; it comes from a little red worm that the cattle lick up, of which he has ſeen many; if it falls under the tongue, the beaſt may be cured, if it be taken in time, and the bladder occaſioned by the bite be broken and rubbed with ſalt; but, if the blain-worm be broken in the mouth of the cow, and be ſwallowed, and goes into her guts, he knows no cure for it; and yet, if the blain-worm be picked up by the cow, and ſwallowed whole, it will go through her, and do no harm. Mr. Edwards's ſervant tells me, he has ſeen two blain-worms in the bladder under a cow's tongue; my ſhepherd ſays, he never knew it to fall under a ſheep's tongue; if they have it, it is by breaking the blain-worm, which being ſo ſwallowed he knows no cure for it.

On the 23d of March (anno 1705) I went down to Gauſuns, where I ſaw Chivers amongſt his beaſts; he was ſaying, he could never ſtir from them at this time of the year; for at the firſt ſpring of the graſs their blood would ſuddenly riſe, which is the blain, and a beaſt was ſoon loſt; and then he ſhewed me one which was growing bad. I aſked him how he knew the riſing of the blood; he ſaid, that a beaſt's eyes would run with water, and, before he dies, as the diſtemper riſes, his eyes will ſwell, and his blood, when bled under the rump, will feel hot: in ſuch caſe, ſaid he, we give them the following drench;—a pennyworth of Engliſh liquoriſh, of Engliſh anniſeed, of turmerick, of long pepper, of horſe-ſpice or diapente * ana, ground all ſmall, and juſt boiled up in a quart of ſtrong beer;—but, if by the heat of the blood one finds the diſtemper to proceed from a hot cauſe, then the horſe-ſpice is to be omitted.—He ſays, though he has rented good lands, yet he never had land ſubject to the riſe of blood before; for it muſt be very quick growing ground, as indeed Gauſuns was.—Mr. Biſſy ſays, the bladder under the tongue in the blain will ſometimes be as big as a pigeon's-egg, and,

* of each the ſame quantity as of the liquoriſh.

if they cannot find the bladder there to break it with their hand, they rake their bum-gut, and find it in their back.

Diſcourſing with a Devonſhire yeoman on the diſeaſes incident to cattle, and particularly the blain, he ſaid there is a diſtemper that falls on a bullock in the ſpring, between April and June, occaſioned by the overflowing of the blood, which they in their country call the bladder; the bullock will be taken with a ſwelling of his lips, and running of his mouth, and ſwelling of his eyes, and running of them; if it be diſcerned before he falls, he is cured by thruſting a pen-knife upwards, from the root of his ear, and bleeding him in that manner, and pulling out his tongue, and rubbing it with a handful of ſalt.

Red-water.

When I was at Mr. Cary's in Dorſetſhire, Mr. Biſhop told me for certain, and upon his own experience, in talking on the blain in cattle, that, if one run a bullock ſo diſtempered through the ear, near the root, with a knife, it would cure him, and was the certaineſt remedy he knew of; he ſeemed very ignorant of ſuch a thing as the blain-worm, but knew well in ſuch caſe, that a bladder aroſe under their tongues, and that many for the cure would rub the bladder with water and ſalt, and break it.—He thought there was no cure for the red-water in ſheep; but ſaid he had often had the fancy to rip up the ſkins of their bellies, and let out the water, and ſew them up again; he ſaid the hog-ſheep were moſt troubled with it.

The haſk.

§. 6. They have in Wilts a diſeaſe on their cows, which they call a haſk or huſky cough; the cow will cough huſkily, and ſeem not to be able to bring up any thing, and loll out her tongue; this diſtemper ſeldom falls on them in the ſummer, but at the beginning of ſpring, and on the yearlings and calves more than on the cows: the remedy is, to take a pint of lukewarm milk from the cow, and put into it a quarter of a pound of the fat of ruſty bacon minced ſmall, and give it the beaſt to drink; you may, if you will, put into it a little ſallad oil; it will do the better, and keep the beaſt faſting two hours before and after.

Of indigeſtion.

§. 7. Notwithſtanding the cow-kind chew the cud, yet they are ſubject to indigeſtion, as may appear from what I this day obſerved in ſome of mine (July 22) which having the night before broke out into ſome winter-vetches, which I was then cutting for winter-fodder for my ſheep, eat plentifully of them, and the next night they ſcoured, and I obſerved in their dung the grain of the vetches whole, and in great quantity.

The maw-bound.

§. 8. There is a diſtemper in cows called maw-bound; their maws will be ſo bound, that what they eat will not digeſt, or paſs, and will grow ſo hard, that what has been taken out, when they cow has been dead, would endure kicking about without breaking; at the ſame time the cow will have a blackiſh watery looſeneſs: the firſt ſymptom it generally diſcovers itſelf by is, the cow will be ſubject to coughing; it is cured eaſily at the beginning by giving them a purge of cream of tartar, aloes, &c. [a] Columella has taken notice of

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[a] In bove cruditatis ſigna ſunt crebri ructus, ac ventris ſonitus, faſtidia cibi, nervorum intentio, hebetes oculi, propter quæ bos neque ruminat, neque linguâ ſe deterget. Si neglecta cruditas eſt,

&

this indigeſtion in the cow-kind, and tells us the ſigns of it are frequent belchings, and noiſe of wind in the belly, cramps, loathing of food, heavy eyes, &c. and adds, that if it be neglected, it is followed by worſe ſymptoms, ſuch as ſwellings, gripings in the guts, groans, reſtleſneſs, and frequent agitations of the head and tail.

The diſtemper in cows called the maw-bound, Mr. Clerk ſays, comes from a ſurfeit by being over-heated by driving, or when a new cow is worried by others; he ſays, a cow will likewiſe ſometimes be maw-bound by eating of ſedges in the water. The cure is, to give her a quart of cream, juſt upon it's breaking, before it is turning to butter, viz. when it is oilyiſh; he ſays, the calves will alſo ſometimes be taken with a cough; the cure is, to boil a pound of bacon, and give them a quart of the liquor in the way of a drench; it will cure them after once taking.

Of ſcouring. See Diſeaſes in ſheep, §. 12.

§. 9. Farmer Way, and others ſaid, that my tenant at Woodhouſe would always ſell a calf at a month old for twenty ſhillings, and his way was, as ſoon as the calf was calved, to boil a piece of the inſide bark of oak as big as one's hand in milk, and give it to the calf to drink, and this at once taking would prevent the calf from ſcouring, though he gave it never ſo much milk after; whereas the danger of filling a calf's belly is of making it ſcour; then he would boil barley-meal and chalk in milk, and put it in a trough to ſtand knee high, and the calves would be frequently licking it.——Note, chalk is binding and drying, which I conceive to be the true reaſon why it is given to calves, the binding quality preventing the flux, conſequently nouriſhing and making fat, as likewiſe making the fleſh white.

For the ſcouring of a horſe, cow or ſheep, take wheat-flour; tie it up in a cloth, and boil it in a pot of water five or ſix hours; then bake it in an oven with a batch of bread; then take it out of the cloth, and keep it in a pot; when you uſe it, take a quarter of a pound of it, and as much bole-armoniac beaten very well together, and a handful of bramble-leaves choped ſmall, and mix it with a pint and an half of cold ſpring-water, and ſo give it to a horſe, and let him drink cold ſpring-water; give it in milk to a cow.

A very good dairy-woman in Leiceſterſhire aſſured me, ſhe was poſitively confident on many and frequent trials, that if a calf has a lax or looſeneſs, though never ſo great, giving it nine horſe-beans to ſwallow morning and night, will certainly put a ſtop to it in once or twice taking; ſhe has tried other remedies without ſucceſs, but never miſſed of ſucceſs in this; a miſtreſs of her's who kept a great dairy, told her the ſecret, which at firſt ſhe thought a jeſt.

Red-water. See red-water in ſheep, §. 13.

§. 10. The following receipts for the red-water in cows and bullocks are frequently uſed amongſt the dairy-men in Leiceſterſhire.—The beſt,—bleed firſt either in neck or tail; then make a good ſtrong poſſet with ſpice, and give it blood-warm; then take a penny-worth of aqua vitæ, a hat-crown full

of

& inflatio ventris, & inteſtinorum major dolor inſequitur, qui nec capere cibos ſinit, gemitus exprimit, locoque ſtare non patitur, ſæpe decumbere, & agitare caput, caudamque crebrius agere, Colum. lib. 6. fol. 161.

of yarrow; pound and ſtrain all the virtue out, and put it to the aqua vitæ; then take a red willow-ſtick and burn it to a coal; pound it ſmall, and put it all together, and give it as ſoon as it can be got ready.—Another,—take of ſhepherds-purſe, red-ſhank (that is, herb-robert) yarrow, knot-graſs, of each alike, and ſhred them all together; then put them into a quart of milk, and heat it with a red-hot iron, and give it blood-warm.

For the red-water in a beaſt;—take mouſe-ear and herb-robert, of each an handful, the inner bark of a barbery tree a pretty quantity, but not ſo much as of either of the other two; chop them very ſmall, and put thereto a quart of new milk; then make it as warm as milk from the cow, and give it with a drenching-horn to the beaſt in the morning, and keep him faſting one hour after, and, if the blood turn not the next day, give him another drench of the ſame, but no more; for if the ſecond draught does not cure him, you muſt kill him, and eat the meat; for it is never the worſe or unwholſomer for that diſeaſe, and the longer you let him live the leaner he will be, and at laſt will die of himſelf.

Note, as to the red-water, and the above receipt, it is to be obſerved, the ingredients are eaſy to be had, and that mouſe-ear is a great aſtringent, and excellent againſt the dyſentery and watery humours, unde, ſays Mr. Ray, ovium gregibus noxia cenſetur.—The barbery in all it's parts has likewiſe the ſame virtues.

The wether in the reins.

§. 11. For the wether in the reins;—take two penny-worth of long pepper, and three ſpoonfuls of henbane-ſeeds; beat them together, and mix therewith a pint of thin grounds of ale or beer; heat it blood-warm, and drench the beaſt, and then wind him up warm in hay.

Note, as to the wether in the reins in cattle, the henbane or the ſeed of it is excellent good againſt the gonorrhæa or muliebria profluvia. Vid. Ray, fol. 711.

Of the wether before or after calving.

§. 12. For the wether that comes forth either before or after calving,—take anniſeed and liquoriſh of each one ounce bruiſed, fennigrick a penny-worth bruiſed, the leaves of ſetwall, (i. e. valerian) and primroſe-roots, of each an handful picked, waſhed, and ſhred, and then pounded; boil all in three pints of ſtrong ale, or beer, till it is half waſted; then ſtrain it, and divide it into two parts, and into one part of it put a piece of ſweet butter, as big as an egg, and give it to the cow blood-warm, and keep her faſting an hour after, and the next day give her the other part of the drench blood-warm, with a piece of butter in it, as before; it is beſt to give it in the morning faſting, except there be need to do otherwiſe, and then the firſt part may be given at any time, as ſoon as it can be made;—and, if it be after calving, and that the cow ſhould heave much, then the wether muſt be thruſt in, and ſewed up to ſticks with a ſtrong awl and ſhoe-thread, and the beaſt be kept warm, and drink warm water for five or ſix days after.—If the wether hang out much, ſome uſe to burn dry bean-ſtalks, and with freſh hog's lard make the aſhes up into balls, as big as great wall-nuts, and thruſt one of them into the beaſt, in the midſt of the wether, and when ſhe heaves it again, put in another ball, and ſo till ſhe is well.

In the above receipt, ſetwall or valerian is good againſt burſtings, primroſe-root is very reſtringent, & cohibendo alvi profluvio magnopere confert, ventriculum atque adeò univerſa inteſtina ſoluta roborat, & fœno-græcum, ſecundum veteres, fæminarum malis plurimum ſubvenit. Ray. Bole-armoniac is very aſtringent, good againſt the diarrhæa and dyſentery, and menſtrua profluvia.

The yellows.

§. 13. Sir Ambroſe Phillipp's ſhepherd ſaid, that their beaſts were never troubled with the yellows, but that the beaſts in ſome other places in the neighbourhood, where the feeding was very groſs and fat, were ſubject to it; ſo that he ſuppoſes rich feeding may be the chief cauſe of that diſtemper:—he thought bleeding was the beſt way to prevent it.

A gentleman in Worceſterſhire told me, January 1696, that his cows had the laſt ſummer been very ſubject to the yellows;—I aſked him, if they were dangerous; he ſaid, they often died of them.—I again inquired, how they appeared; he ſaid, the whites of their eyes would look very yellow, their ſtomachs fail, nor would their food prove them; their udders would ſwell, and their milk fall away, and look yellowiſh; he ſaid, if it fell on their back and loins, it was not eaſily cured, but, if it fell only on their udders, it might be cured by letting blood and drenching, and, if it were taken betimes, blood-letting only might do.—An hour after a farmer came in, and agreed to this, ſaving that he knew not what the yellows on the back and loins were.

A certain farmer ſaid (in July anno 1701) that a cow of his had lately had the yellows, and the firſt coming of them to be known was by her milk being wheyiſh, and in rags, before ſuch time as her udder looked yellow; he ſaid farther, the remedy he uſes, is, to bleed the cow preſently, and then to take hot embers, and milk ſome of the cow's milk into them, and rub her udder therewith at evening milking-time for two or three evenings;—he ſays, the cure by hot embers has been by experience very well approved of. In this diſtemper, if a cow has not a ſpeedy remedy, ſhe often loſes a teat, and ſometimes her udder.

The black-legs or wood-evil.

§. 14. They have a diſtemper in Leiceſterſhire frequent amongſt the calves, which in that country they call the black-legs; but Mr. Glenn, who lives at Utoxceſter in Staffordſhire, calls it the wood-evil. It ſeems it is a white jelly, and ſometimes a bloody jelly ſettling in their legs, from whence it has it's name of black-legs, and often in the neck between the ſkin and fleſh, which will make them carry their necks awry.—I find by Sir Ambroſe Phillipp's ſhepherd, it is of the ſame nature with the wood-evil in ſheep, which, he ſays, are alſo ſo affected, and ſo properly may be called the wood-evil; and, like the ſheep, if it falls in the calves joints, they overcome it, but if in their bowels, they die, nor is there any cure.

V. Diſeaſes in ſheep.

The haſſacks.

§. 15. Farmer Stephens ſays, for the haſſacks in calves he takes thin ſlices of the very * raſtieſt fat bacon he can get, and ſhreds it into ſmall diamond-cuts, and then makes milk blood-warm, and puts as much of the ſhred raſty bacon into it as will anſwer the quantity of bread uſually put into milk, and of

* ruſtieſt.

of this milk and rafty bacon he uſually gives two hornfuls to each calf, which cures them without fail, when they have been ſo bad as to loll out their tongues; he ſays, the quantity of milk you may give to each calf may be three quarters of a pint.—Farmer Chivers ſays, for this diſtemper he gives two or three balls, as big as cheſnuts, of an equal quantity of butter, tar, and rue choped ſmall, and puts them down the calf's throat beyond the quilt.—Farmer John Sartain ſays, it is looked on that haſſacks often come on calves by their feeding on drier graſs than ordinary, or by reaſon of their wanting water.—This might be the main occaſion of it in the calves I brought out of Wiltſhire, becauſe my graſs was drier than that, and, though they had plenty of water, yet it might be ſuch they did not not like ſo well as what they had been uſed to in the vale, calves being nice; and drought ſeems likely enough to be the cauſe of it, both in reſpect of food, and for want of water, becauſe it is generally agreed that the brouſing on wood will give calves the haſſack.

Mr. Beach ſays, he has ſtood by and ſeen his father and his tenants give the following drench to their calves for the haſſacks, viz. take about three quarters of a pint of milk, and heat it blood-warm, and put to it two ſpoonfuls of ſallad-oil, when the milk is thus blood-warm, and give the ſaid quantity to each calf; it will be about two hornfuls.

The pipp.

§. 16. If a calf takes the teat into it's mouth, and refuſes to ſuck, ſuſpect the barbes under the tongue, almoſt in the manner of the pipp, which you may take away gently, &c.—Maiſon ruſtique.

Oat-hulls in oxen's eyes.

§. 17. I ſaw an ox's eye almoſt out, as I thought; three farmers ſtanding by ſaid, it was only an oat-hull, which among the fodder would frequently get into their eyes; powder of ſugar or ginger blown into their eyes would, they agreed, cure them.

Of greaſe in the heels.

§. 18. I ſaw (in Auguſt 1699) one of Sir Ambroſe Phillipps's cows with a bunch and ſwelling on the outſide of either hinder leg, and I aſked the cauſe of it. His dairy-maid and the ſhepherd ſaid, that the cow being in high caſe when ſhe calved about Michaelmaſs was two years, heated herſelf in calving, and cold weather coming upon her, ſhe took cold, and ſo the greaſe fell into her heels, but ſhe was never the worſe; it was only an eye-ſore.

The loore or ſore between the claws. V. the loore in ſheep, §. 16.

§. 19. Farmer Elford of Upcern in Dorſetſhire tells me, cows will be ſo ſore between their claws that they cannot ſtand, and will pine upon it; this he and others informed me, in that country was called the loore, and they agreed, that a hair-rope rubbed between their claws till the place bled would cure them; but Elford adds, that what will ſpeed the cure is, to take verdigreaſe and lard, and mix them together, and anoint the place: this he uſes to do, and had it as a great ſecret, from a cow-doctor.

Diſcourſing with old Wilkins, a notable farmer of Hathern in Leiceſterſhire, he and another creditable huſbandman agreed, that the fowle or loore in ſheep's feet came from their going in wet ground, and was increaſed by the long graſs and ruſhes which got between their claws, the paſture-ſheep being moſt troubled with it, but it ſeldom afflicted the folded-ſheep: he ſaid, bleeding a cow troubled with it on each ſide the claws, would, at the beginning, before it was too far gone, cure it without doing more: but then it was, he ſaid, a common ſaying, that you muſt cut up the turf ſhe bled on, and carry it, and hang it up in a hedge, and, as the turf grows rotten, the claw will grow well: but, ſaid he, the meaning of cutting up the turf and carrying it away, is, becauſe, if the freſh blood of a cow lies on the ground, the whole herd will come and ſmell to it, and fly about the ground, and fall foul on, and puſh one another, and ſpoil one another: for which reaſon, if a cow be bled in the tail for the worm in the tail, they always ſtaunch and dry up the blood in the wound perfectly well, before they turn her out to the herd, otherwiſe they would ſmell at her, and puſh her, and one another.

§. 20. Being in May (anno 1712) in company with Chivers, Stephens, &c. and having lately had a cow tail-ſoaked, or with a worm in her tail (as before noted) I was deſirous to diſcourſe on that ſubject with them, and I found they all well knew the diſtemper, and had it amongſt their cattle: they agreed, that, though it ſometimes fell on cattle in good caſe, yet it more generally afflicted poor cattle.—They did not ſeem to obſerve, as Mr. Hayes, a gentleman farmer, whom I before had conſulted on this diſtemper, had done, that a cow which had once had it, was more liable to it afterwards than another cow.—I aſked them, whether they had ever ſeen a real live worm in the tail; Chivers only in the company pretended to have ſeen ſuch a thing, and ſaid, he once ſaw a long narrow fleſhy ſtring, like a thread, cut out, it was of a red colour, and moved: they all agreed that the cow could not riſe up in ſuch a caſe; and that the cure was to ſlit the tail where it was ſoft, and with a rag to bind in ſalt, ruſty bacon, ſoot and garlick beaten together, and one of the company added rue; but the tail muſt not be bound too hard, nor continue bound above a week, leſt the cow ſhould loſe the bruſh of her tail: they ſay, in ſuch a diſtemper a cow's teeth will be very looſe: it ſeems, cows teeth are always in their beſt health ſomewhat looſe, if you thruſt them inwards with your thumb; mens teeth will alſo be looſe under ill habits of body.—Note, it ſeems to me, that both the medicine of oil of turpentine rubbed in, as mentioned in another place, and this medicine, act their cure by heating the marrow of the cow's back and loins, with which the ſpine of the cow's tail has a communication, for the diſeaſe ſeems to lie in the back, and that the tail indiſpoſed alone could not in ſuch manner affect a cow as to weaken her to the degree above related. Tail-ſoaked.

Speaking farther of this diſtemper to a Dorſetſhire farmer, he told me, they call it the worm in the tail; the joint of the tail near the rump will, as it were, rot away, and the teeth of the cow grow looſe, and her ſtomach fall off, ſo that it will in a very little while ſink the ſtouteſt cow or bullock, tho' it ſeldom falls on a bullock in good caſe, but generally on cattle when they are poor.—The cure is, to cut a deep gaſh into the ſore, at the rump, and rub a handful of ſalt into it, and ſo bind it up with a rag.—Again talking of it to farmer Ryalls, he agreed to what the other had ſaid, only he added, they mixed ſoot and a clove of garlick with the ſalt, and that the tail muſt be well and carefully cut, or elſe the kine might be in danger of loſing their tails; he ſays, though they call it the worm in the tail, there is no worm there, but he takes it to ariſe from the blood, when the blood runs high.

The DAIRY.

Of cleanlineſs in the dairy.

§. 1. SO much cleanneſs in ſcalding relates to a dairy, that Chivers of Wiltſhire averred (farmer Sartain being preſent, and conſenting thereto) that the dairy-farms ſpent as much wood in fire, to that end, in ſummer, as they burned for other purpoſes in winter.

If the milk-veſſels are not kept clean, they will be ſour, and the cheeſe will be ſour before it can come, and will eat ſour and choaky.

Of coolneſs.

§. 2. Chivers took notice how a cool dairy was a great means towards preſerving the cream the longer from turning ſour; ſaid he, my milk-houſe is too ſmall for ſo great a dairy as mine is, for the milk coming in hot, the ſteam of it heats the air of the room.

Of cows not giving down their milk.

§. 3. My next neighbour had a calf penned up, and the cow grazed in a ground by it, and the cow being kept from her calf, and yet able to come up near to the pen, grew unlucky to pigs that were routing in a dunghil near, and gored one of them in the eye, whereupon ſhe and her calf were turned out together, but then the cow would not give down her milk to them that milked her.—I aſked the farmer's wife, a notable dame, the reaſon of it. She ſaid, when the calf was penned up, and the cow was brought to it, when they milked her, the calf was hungry, and would ſuck hard, and the cow would give down her milk to the calf, and then the maid alſo might milk her, but when the calf was turned abroad with the cow all day, when the maid came to milk her, the calf not being hungry, the cow would hold her milk up from the maid; and ſo, ſhe ſaid, other cows were apt to do.

A gentleman farmer of Glouceſterſhire told me (anno 1698) that he had a cow of ſix years old that had uſually given good milk, but the laſt year ſhe would hold up her milk, and would not give any, and he knew not what ſhould be the reaſon of it.—A farmer coming in, I aſked him his opinion about it. It is odds, ſaid he, but ſomebody has ill milked her; for if one milks ſuch a cow by halves, that is, to ſtep away, and come again, or to keep talking and milk her in a very ſlow manner, the cow's patience will be tired, and ſo ſhe will get that trick.

How many cows a woman may milk in an hour, &c.

§. 4. I aſked farmer Clerk of Holt in Wilts, how many cows a very good dairy-maid might be able to milk in an hour; he ſaid, and they preſent all agreed, that it was a good hour's work in their country, where the cows gave a great deal of milk, to milk ſix in an hour; he ſaid, he thought his wife could milk as faſt, and with as much ſtrength as any body could, and ſhe could once he believed have milked eight, but ſhe was not able, though of but a middle age, to do ſo now: farmer Chivers, and farmer Stephens agreed to this.—They alſo ſaid, when cows began to give off their milk, they would, if not milked clean, ſoon grow dry.—I put the queſtion, when it was that the cows began to give off the height of their milk; they agreed, that they began to abate about the time of the bloſſoming of the wheat, and ſo on, till a good aftermaſs came, and then for a little while their milk would increaſe again, but cold and rainy weather in the autumn will daſh the cows, and then their milk will abate again.—I take the reaſon why the cows milk abates about wheat-bloſſoming time, to be, becauſe about that time the graſs of the field bloſſoms alſo, and the fluſh of the ſap is come to it's height and maturity, and then abates; for the roots of the graſs at that time begin to harden and grow dry, nor do they take in the juices of the earth ſo freely as they did before, and ſo grow drier and drier till the ſeed is hardened; which ſeed being ſo brought to maturity, the roots of the graſs for ſome time, till the cold and winter checks them, ſtrike freſh ſap-roots, or buds preparative to the enſuing ſpring, and which will the next year be the ſpring-roots and increaſe; on theſe new efforts or eſſays, as aforeſaid, in autumn, after the ſeed of the graſs is perfected, depends the ſtart of the autumn-graſs till the cold checks it, which we call the aftermaſs, and from whence the cow's milk ſomewhat increaſes.

How to know when cows have been well milked.

§. 5. Good houſwives may know whether cows are well milked or not; for if the quantity of milk does not yield ſo much cream as it ſhould do, were the cows milked dry, then they may be aſſured that the cows ſtroakings are not milked away, for, if the ſtroakings are left behind, much the greater portion of cream in proportion is left in the udder; becauſe the wateriſh part of the cream comes away firſt, and the fatteſt at laſt; for they, being the laſt of the cow's milking, lie up higher in the udder; and conſequently are more digeſted and concocted by the internal heat of the cow's belly.

Of a cow's udder that has been bruiſed.

§. 6. Sir Ambroſe Phillipps had a cow which, when milked, gave blood with her hinder teat; and the dairy-maid endeavoured, as I obſerved myſelf, with great pains to milk that teat; and after ſqueezing with all the power ſhe could, there would come forth a ſtring of coagulated blood two or three inches long, which being removed, the like would follow three or four times together, and then there would come forth milk from that teat, as at other times, though much diſtained with blood: the cow all the while would endure the milking, only when the maid ſtroaked the upper part of the udder behind, to bring down the bloody matter, her hurt being conceived to be there, ſhe would not endure it; this held for near three weeks.—And it ſeems they had known the like before: it was ſuppoſed another cow had run her horn againſt the bag of the udder behind, and bruiſed it, and they anointed the udder behind only; all the reſt of the teats gave good milk.—It ſeems, if a lazy maid, who would not have taken ſo much pains with the teat, had had the managing of the cow, the bloody milk having had no vent, would have ſpoiled the udder.

Of a cow's udder growing hard after calving.

§. 7. Sometimes a cow's udder will be hobbed after ſhe has calved, that is, will be very hard like a board; the cow will not give down her milk well, and her udder will afterwards quarne, that is, grow knotty; in ſuch caſe, till her udder is come into order, her calf ought not to be taken from her, becauſe ſhe will not give down her milk ſo kindly to the hand as ſhe will to the calf, and thereby her udder will be apt to grow ſore, and break as womens breaſts do.

Of hill and vale-country cows. See §. 27. Of cheeſe.

§. 8. Mr. Whiſtler obſerved, that the hill-country cows milk did not yield ſo much cream to the ſame quantity of milk as the vale-cows milk will do.—But ſurely this muſt proceed from the poverty of the hill-country cows, they being generally poor in caſe: your thin necked and bodied cows, that are waſhy and flue, are obſerved to give a great deal, though but thin milk: but ſeeing our beef and mutton, when fat, eats as ſweet as any in the world, I cannot conceive why the milk of our cows, if they were in as high caſe as the vale-cows generally are, ſhould not yield as much cream as their cows milk does.

I have heard it obſerved by ſome farmers and dairy-women, that cows with yellow horns, or with thick necks give generally very good creamy milk, and that cows with thin necks are generally remarked to be flue cows, that is, cows that will not thrive with their meat; and theſe will give a great quantity of milk, but it will be of a blue or grey colour, and will yield but little cream. A cow, they ſay, ſhould not be milked within about ten weeks of her calving, for though ſhe will give good milk to the very day of calving, yet the calf will be thereby ſtarved. A cow ſhould be milked very clean, or her milk will dry away.

Profit of a cow.

§. 9. Farmer Moſeley of the Iſle of Wight, and his wife, being at Crux-Eaſton (anno 1698) they gave me the following account of a dairy; viz. that 45s. per cow rent, was counted a good price in the iſland, that formerly it uſed not to yield ſo much, but upon the riſe of butter and cheeſe, it now fetches as above: take one cow with another in the iſland, if they give two gallons of milk per day it is well; which will yield four pound of butter per week; and from June to Michaelmaſs, if a cow yields 70 lb. of butter to be potted, which comes to 23 s. 4d.—and an hundred weight of ſkim-milk cheeſe at 1½ d. per lb. that is 14s. per hundred, it is what is commonly expected; beſides which, there is the May-butter, for in the iſland they begin not to pot till June: then it is ſaid, a cow's whey will maintain a pig; but, ſaid he, it will not; the calf alſo may be valued at ſixteen ſhillings.

Of taking away the beaſtings.

§. 10. In caſe the firſt milk, which they call the beaſtings, be not taken away clean from the cow, upon her firſt calving, it will go near to make the cow's milk to dry away.

Of giving the beaſtings to a calf.

§. 11. The Roman writers on huſbandry forbidding the colaſtra or beaſtings to be given to the calf, as if it was a poiſon, I aſked farmer Stephens about it, he being in his way a notable obſerver, and milking a great part of his dairy-cows with his own hand: he ſaid, at firſt he did let the calves ſuck the beaſtings, and found no inconveniency in it, but, ſaid he, I have very often obſerved, when a cow has warped her calf, and we have put a calf of ten days or a fortnight old to draw down the udder (which is better done by a calf than by hand, becauſe the cow is apt to hold up her milk when milked) that a calf of that age has been much purged by the beaſtings, and received a great deal of harm thereby; and therefore he held that the beaſtings might ſurfeit, and had better be drawn off; it ſtands to reaſon, if one ſaw what a curdled body they are of.

Of thunder breaking cream.

§. 12. Thunder will ſo break the cream, and turn the milk in the milk-pans, that no cream can be ſkimmed up for butter; nor will the curd for cheeſe hold together, but will break aſunder.

Of a quart of cream making a pound of butter.

§. 13. Though it be commonly ſaid, that a quart of cream will produce a pound of butter; this muſt be underſtood of a quart of cream that has ſettled two or three days, for three pints of cream juſt ſkimmed from the milk will yield in three days ſtanding little better than a quart. If you bring in the milk, and ſtrain it preſently into the pans, without letting it ſtand to cool before you ſtrain it, there will be much the leſs cream.

Beſt butter and cheeſe made after June. Vid. 304. Of Cheeſe.

§. 14. Farmer Elford, of Chubbs, near Upcern Dorſet, ſays, he reckons the beſt butter and cheeſe to be made after June; and whatever may be ſaid of May-butter or cheeſe, he thinks it not ſo good by much as that made afterwards; and his reaſon is, that though the graſs comes on thick in May, yet till the end of June the cattle do not recover their winter hardſhips, and though the graſs be in good caſe in May, yet the cattle muſt likewiſe get into heart before they can give abundance of milk, or that that is very good.

Of ſcald cream for butter.

§. 15. I am informed, that throughout Devonſhire they make their butter in a different manner than elſewhere; for they ſet the milk over the fire in many braſs pans to warm in, which makes the cream riſe, and when a bladder riſes in the middle they take it off the fire, and take off the cream, and put it into a tub, and it then looks like a clouted cream; then a maid only by putting in her arm and ſtirring it, brings it to butter preſently, which is very rich butter, but the cheeſe that is made of the ſkim-milk is very poor and has little goodneſs in it.

Butter dearer about peas and beans time.

§. 16. It is agreed by the dairy-men about Holt, that againſt peas and beans time graſs-butter riſes in it's price by reaſon of it's conſumption on thoſe legumens, therefore good houſwives collect butter a month before that ſeaſon, and ſalt and pot it.

Of rennet.

§. 17. I have heard that a young heifer's maw that has never been with calf, makes ſtronger rennet, and is better for cheeſe than a calf's maw.

The richer the paſture the longer the cheeſe muſt be kept.

§. 18. I find by the converſation of Chivers, John Sartain, and many other judicious dairy-men about Holt, that cheeſe made between hay and graſs is apt to heave, (i. e. when the cattle eat of hay and graſs, as in the beginning of the ſpring) and is a ſtronger ſort of cheeſe than graſs-cheeſe, and therefore is not fit to be ſent to market under a year old, becauſe till then it will not be mild: in a word, I find by all the information I can get, that the richer the ground is (as it is with the ſtrongeſt beer) the cheeſe of it muſt be kept the longer before it is ripe, ſo as to eat mild and palatable, and then none will eat better.

Of cheeſe.

§. 19. I am informed by farmer Stephens, my tenant at Pomeroy in Wilts, who is the moſt experienced man in all things relating to a dairy that ever I met with; firſt, that, if milk be ſour, the cheeſe thereof will always eat * chocky and never eat fat, though there be never ſo much cream put into it, which is the reaſon why chedder-cheeſe often eats ſo, being made ſo large, that they keep their milk collecting too long; ſuch cheeſe in toaſting will burn and bladder, a ſure ſign it is not fat.—Secondly, ſuch cheeſe (to ſhew it is dry and not fat, notwithſtanding a great deal of cream be put into it) will in it's coat on the milk-houſe ſhelves look white and dry, and never gather a blue coat: neither will cheeſe over-ſalted ever gather a blue coat, but in toaſting burn at the fire, tho' never ſo much cream be in it, and will look white and dry in it's coat.

* Dry, chalky.

In Somerſetſhire and Wiltſhire.

§. 20. Being with Stephens about Eaſt-Lydford near Somerton in Somerſetſhire, and having there buſineſs with a great many farmers, I found by Stephens and the confeſſion of thoſe farmers, that notwithſtanding their lands were much richer than thoſe of North-Wiltſhire, they could not pretend to make ſuch good cheeſe as was made in North-Wiltſhire, and that the North-Wiltſhire cheeſe of the ſame ſort would out-ſell the Somerſetſhire cheeſe by three ſhillings or four ſhillings in the hundred weight.—It was allowed alſo, that the Somerſetſhire women could not make a cheeſe with a yellow coat like thoſe of North-Wiltſhire; wherefore the Somerſetſhire women, to diſguiſe it, put ſaunders into their milk, to give a yellow colour to the coat of their cheeſe, which giving alſo a yellow colour to the inſide, when people put in the taſter, they find the art, and upon diſcovery take exceptions, for the inſide of the North-Wiltſhire cheeſe is white.—And it was confeſſed by all and agreed that down farther weſtward, tho' the lands were better, yet the cheeſe was worſe than in thoſe parts of Somerſetſhire I ſpeak of.—This allowed of difference between the North-Wiltſhire and Somerſetſhire cheeſe gave me many ſpeculations into the reaſons for it, and I aſked them preſent about it.—Stephens above-mentioned would have it, that in Somerſetſhire they were not ſo good houſwives as in North-Wiltſhire, nor would he give any other reaſon, notwithſtanding I had ſaid, if the difference conſiſted in art, inter-marriages would ſoon rectiſy that miſchief, and a farmer that is choice in the breed of his bull and his cow, and goes far for them, would alſo ſend for the beſt dairy-maid in the country of North-Wiltſhire; for the difference he ſpeaks of amounted to at leaſt twenty pounds in two hundred pounds rent per annum, and it was not to be conceived a whole county would be ſo ſtupid as to ſuffer ſuch a loſs, when the North-Wiltſhire parts, wherein he lived, were but twenty-four miles diſtant from thoſe parts of Somerſetſhire I was then in.—They allowed alſo at Wincheſter fair, if the fair was dull, the Somerſetſhire men muſt ſtay a day the longer before they could ſell.—I cannot give a reaſon for this, unleſs the following be one, viz. Somerſetſhire lying low and wet, though the grounds are very rich, the juices of the graſs are from thence leſs ſpirituous, and leſs concocted and digeſted, more groſs and gnaſh, and conſequently the cheeſe wants the virtue of that from the North-Wiltſhire grounds, where though the graſs may grow ſlower, yet the watery juices are more rectified and qualified: therefore all this, if it be true, muſt depend on theſe ſuppoſitions;—Firſt, that dry grounds, by reaſon of poverty, afford no rich juices, and conſequently no good cheeſe, for we muſt not ſay, becauſe North-Wiltſhire being drier than Somerſetſhire outdoes it in cheeſe, therefore the hill-country in Hampſhire being drier than North-Wiltſhire has better cheeſe, for the contrary is evident—Secondly, that there is a medium in the watery temperature of the earth, either extream of which viliorates the juice, where there is not an equal heat of the ſun or fatneſs in the earth to correct the juices of the ſuperluxuriant graſs.

In North-Wiltſhire the greater the plenty of cheeſe, the dearer it ſells.

§. 21. This ſpring (anno 1720) was throughout a cold and very wet ſpring, and the ſummer was wet and ſhowery till July the 18th, and a great burden of hay and graſs there was in North-Wiltſhire, unleſs in the water-meads, where they were ſtranded; however cheeſe bore a great price, viz. twenty-four ſhillings per hundred, for that firſt made in the ſpring; and the tenants of Holt who were going with their cheeſe to Maudlin fair at Wincheſter, which is on the 22d of July, expected a higher price: the reaſon of which was this; the laſt ſummer was ſo very dry, and the winter-meat, both hay and ſtraw fell ſo very ſhort, that the generality of cows were much pinched, ſo that the cows about Holt gave but little more milk or cheeſe this wet ſummer than they did the ſummer before; again it is generally noted that in North-Wiltſhire when they make moſt cheeſe, they ſell it deareſt, and when the leaſt, they ſell it cheapeſt; the reaſon is, in wet ſprings and ſummers, the generality of North-Wiltſhire not lying low and wet, as Somerſetſhire does, in thoſe years they make moſt cheeſe there, whereas the land of Somerſetſhire, and Lincolnſhire, and the deep lands of England lie all the ſpring and ſummer under water, or ſo much in a poach, that the graſs is chilled, and cannot grow; but in the North-Wiltſhire ſummers it is the direct contrary: then in cold wet ſummers the firſt cheeſe-fair of our parts, which is Maudlin-hill fair, carries the beſt price of all the later fairs, as falling before the Somerſetſhire cheeſe can come to a fair.

Of the blue coat or vinnow on a cheeſe.

§. 22. Stephens having before made it one of the characters of a good cheeſe to carry a blue coat on it, or a vinnow: I aſked him whether it were good houſwifery to wipe that off. He ſaid, there were two ſorts of vinnow on cheeſe, one in the nature of mouldineſs, or long downy vinnow, not blue, which proceeded from the moiſture of the air and weather, eſpecially towards winter, and ſuch vinnow cannot be too often wiped off; and, if neglected, it will eat into the cheeſe, and give it a bitteriſh taſte within the coat; whereas the blueiſh vinnow he ſpoke of proceeded from the inward ſweat of the cheeſe, and would come on the cheeſe in dry weather as well as moiſt.

Of three ſorts of cheeſe.

§. 23. Of the three ſorts of cheeſe, viz. the hay cheeſe made ſome time after the cows calving, the ſpring-graſs cheeſe made in May and June, and the aftermaſs cheeſe, though the aftermaſs cheeſe be the heavieſt, and but taſteleſs, yet it is the fatteſt of the three, and, if it be kept to a good age, is a ſingular good cheeſe; for then the cows milk has the moſt cream: the hay cheeſe, if the cattle feed on good hay, will caſt as yellow a colour on the coat as any, and being made in the ſpring, will have a very hard and ſmooth coat, having the ſpring to dry it in; it is a very good cheeſe, and very profitable in a family, being very tart on the tongue, and will go very far in ſpending.

Of aftermaſs cheeſe.

§. 24. Being at Pomeroy in Wilts to taſte cheeſe in the beginning of November, (anno 1714) Stephens, having ſold his cheeſe made in the ſpring, had only the early aftermaſs cheeſe fit for ſpending left; but he and his wife aſſured me, ſuch cheeſe was fatter and mellower than the cheeſe made in April, May, and June, though the ſpring-made cheeſe was tarter: I aſked them how the aftermaſs cheeſe could be termed the fatteſt, when certainly the graſs in May and June was richer than in July, Auguſt, and September.— They ſaid, they ſuppoſed the reaſon to be, becauſe the cows about April having brought calves, which were not weaned from them till about the beginning of May, the cows were low in fleſh and condition, having had little graſs to ſupport them till then, and when the fluſh of graſs comes in May, it is true they give a great deal of milk, but not ſo much cream in proportion, nor ſo fat milk as in the aftermaſs ſeaſon, when the cows being got into good heart, and fleſh, they better concoct and digeſt the juices of the graſs with thoſe of their own bodies.—So from thence, ſaid I, it muſt follow, that a poor cow muſt always give thinner milk than a cow in good fleſh. Again, I ſuppoſe on this reaſon depends in ſome meaſure the tartneſs of the cheeſe made in the ſpring, becauſe the cows have not then good juices in their own bodies to qualify and mellow the acrimony of the juices of the graſs, nor has the ſun had time to concoct the juices of the graſs, which are therefore eager and tart.

Broad-clover will not make good cheeſe.

§. 25. Mrs. Biſſy the elder of Holt aſſures me, that broad-clover will not make good cheeſe; for it will taſte ſtrong and bitter, yet they have not found it to heave: ſhe alſo ſays, that neither the milk nor the butter taſte well.

A cheeſe-loft ſhould be high and cool.

§. 26. It is agreed by the dairy-men in Wiltſhire, that the higher in the ceiling a milk-houſe is, and the leſs heat underneath, as from cattle in a ſtable, &c. ſo much the better for a cheeſe-loft; for heat makes cheeſe heave, eſpecially if the land it be made from be rich.

Where cows give the leaſt milk, the milk has more cream in proportion to the quantity.

§. 27. When farmer Sartain and farmer Stephens were making remarks how the cows of Gauſuns exceeded thoſe of Pomeroy in milk, yet they agreed that no cheeſe exceeded that of Pomeroy, and that thoſe dairies, where the cows give ſo much milk, did not make the richeſt cheeſe; for, ſaid they, where the cows give the leaſt milk, the milk has more cream in proportion to the quantity.— * But this ſeems to be contrary to a former obſervation: and farmer Sartain ſaid, this I know by the farm at Holt, for when I lived there, none made better cheeſe than I did, though I rented only the arable and poor grounds.—Upon which I objected ſoon after to farmer Sartain and farmer Chivers, how then it came to paſs, that poor ground would not make rich butter? to which Chivers replied, that doubtleſs it would; that is, ſaid he, if you ſhould have a ſufficient large dairy, and milk enough to make butter every

* Vid. §. 8.

every day, or every other day at fartheſt; for then the cream being ſweet, the butter would be ſweet and rich alſo; whereas poor and ſmall dairies churn but twice a week, and then, the cream being turned or upon turning, the butter cannot be good. And the cream of ſour and coarſe graſs, ſuch as mine is at Crux-Eaſton, will ſooner turn ſour in proportion to the ſourneſs of the graſs.

Spring-cheeſe riſes in price towards Candlemaſs.

§. 28. September 5th (anno 1712) being at Holt in Wiltſhire, I encouraged my tenant Stephens of Pomeroy to come to Crux-Eaſton in Hampſhire at Michaelmaſs to ſell his ſpring-cheeſe; viz. that made in May: and he ſeemed inclinable to do ſo.—Of which deſign of his I acquainted farmer Chivers the next day.—Chivers ſmiled, and ſaid, he thought Stephens would be wiſer than to go ſo far at that time of the year to ſell his beſt ſpring-cheeſe; for, ſaid he, ſuch cheeſe does not likely meet with the beſt price till towards Candlemaſs, when the aftermaſs cheeſe is ſpent, for in autumn and about Michaelmaſs there is ſuch abundance of ſoft aftermaſs cheeſe to be ſold, and the poorer ſort of dairy-men pour it ſo faſt into the market, as alſo their ſpring-cheeſe (for then theſe dairy-men's harveſt is over) that the ſpring-cheeſe will afterwards riſe in it's value, like hard-keeping pippins, which yield double the price at Chriſtmaſs that they would in autumn, when the country was full of all ſorts of ſummer-apples, the great plenty of which ſummer-fruit depretiates for ſome time the price of the hard-keeping fruit: and in like manner, when the corn harveſt is juſt in, ſo many farmers occaſions for money being to be anſwered, the beſt corn will not generally come to the beſt market till the glut is over, and the barns grow empty: I grant, ſaid farmer Chivers, the latter made or aftermaſs cheeſe we muſt all properly ſell, whether poor or rich, becauſe though the aftermaſs cheeſe be in truth as fat as the ſpring-cheeſe, yet it is a heavy deadiſh cheeſe, and will grow tough or glewiſh by keeping, whereas there is no occaſion for ſelling the ſpring-cheeſe, unleſs for want of money, becauſe that will grow mellow and gain ſpirits by age.

In Wiltſhire when wheat is dear, cheeſe is dear, and why.

§. 29. Mr. Raymond told me (in June anno 1709) it was always obſerved about them, at Puckſhipton in Wiltſhire, about two miles from Patny, that when wheat was dear, cheeſe was dear alſo, which ſeemed ſtrange to him; becauſe, ſaid he, it was a wet and cold ſpring that made wheat dear, and then we have always the greateſt plenty of graſs, which one would think ſhould make plenty of cheeſe.—I replied, according to a former obſervation, the reaſon was plain to me, becauſe the country where he lived, and Pewſy in his neighbourhood lay on warm ſands, which land, and the hill-country of Wiltſhire within two miles of him, bore great burdens of graſs, as he ſaid, in wet and cold ſprings; but, ſaid I, the deep and low lands of England ſuch as Somerſetſhire, &c. &c. which ſort of lands ſet the price to cheeſe as well as wheat, miſerably fall ſhort of a crop of graſs in cold and wet ſprings, as I told him I was but then newly an eye-witneſs of, for I came then from Eaſt-Lydford in Somerſetſhire to him, being June 19th, and the grounds of that country had not then got a good bite of graſs, by reaſon of the cold wet ſpring, nor had they been able to fat cattle in time.

Hill-country land improper for a dairy.

§. 30. Our hill-country land is ſo much the more improper for a dairy, becauſe our foddering-ſeaſon holds ſo very long, and is ſo tedious, by means of our rowet-graſs falling off a month ſooner than their's in the vale, and the ſpring graſs coming a month later; ſo that the cows muſt needs be in a low condition at ſpring.

As I have taken notice that the clover is ſour in cold lands, ſo doubtleſs the butter and cheeſe muſt partake of it's nature more or leſs, as the clover may be ſourer or ſweeter, which may reaſonably be ſuppoſed to be the cauſe of the butter and cheeſe at Eaſton being ſtrong and rank[a].

SHEEP and LAMBS.

The ſhepherd to mend hedges.

§. 1. IT is very neceſſary in incloſed farms, that, if the ſhepherd be not required to hedge at ſpare times, he ſhould however be required to mend, for his buſineſs being much in walking about the grounds he has the opportunity of ſeeing what is amiſs.

Benefit of a foddering-cart.

§. 2. My ſhepherd aſſures me, that by my ſhepherd's cart I ſhall ſave the value of it this one year (anno 1701); for, ſays he, it is impoſſible in this hill-country but broad-clover hay eſpecially muſt be abundantly blowed away by the wind, when it is carried by bundles at the ſhepherd's back; whereas the ſides of the cart will preſerve it from the wind.

Advantage of keeping up a flock of ſheep in open common fields.

§. 3. Having made ſome remarks on the ſmall profit ariſing from a flock of ſheep, I imparted the ſubſtance of it to a gentleman in my neighbourhood, of long practice in huſbandry; he ſaid, that I was in the right of it, who lived in incloſures, but if he, where there was intercommoning, muſt buy new ſheep yearly at ſpring, that were not uſed to ſhift for their living, in their bare commons they would be ſtarved; they muſt therefore keep up a flock accuſtomed to the place.—Add to this, that the winter-fold, by reaſon of the graſs not being ſo ſweet, and the froſts falling on it, is not ſo good as the ſummer-fold.

Beſt age of an ewe and ſheep.

§. 4. Mr. Biſhop of Dorſetſhire his ſhepherd ſays, they generally reckon an ewe's third lamb to be the beſt; and they reckon a ſheep to be at full growth and prime at four years old; though, he knew not, he ſaid, but, if an ewe had great keeping, ſhe might belly ſome time after that; ſome ſheep would grow broken-mouthed at five or ſix years old, and others not till nine or ten: when they find an ewe a good motherly one, and to bring a good lamb, they keep her till ſhe is broken-mouthed.

Of ſheep's teeth.

§. 5. Sheep at two years old have but two teeth, at three years old they have four teeth, at four years old ſix teeth.

OF BREEDING SHEEP.

Sheep from a warm country do not thrive on the hills.

§. 6. I bought about forty ewes out of Oxenleaſe in Wilts (anno 1718) where the ground is coarſe, and they alſo fared hard; I brought them to

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[a] Among other uſeful inventions with which the reverend and learned Dr. Hales has obliged the world, he has publiſhed one to ſweeten milk that has got an ill taſte from the cows eating of crow-garlick, cabbage, turnips, autumnal leaves, &c. which he effects by volatilizing the rancid oil with heat, and, when heated, diſſipating it by ventilation.—See his Account of the good effect of blowing ſhowers of air up through milk, and alſo a Plate of the inſtrument for performing it, printed for Richard Manby, in the Old-Bailey, near Ludgate-Hill, 1756.

Crux-Eaſton in October, where they had plenty of hop-clover; they ſeemed to do very well till December came, and then they crouded up under ſhelter of hedges, and ran into the lanes, and their wool being thin, and ſhort, and more knotty than our's, they could not bear the cold of Crux-Eaſton well, nor keep the open fields in winter, nor could we hold them with the beſt hay, but they would pitch.—From hence quære, whether it be ſo good huſbandry as is imagined, to mend our flock of ſheep or cows by a fine wool-ſheep or Glouceſter-brown; ſince the produce carry ſuch thin fine-grained hides, as may not prove ſo well on our cold hills.

§. 7. Sheep without horns are counted the beſt ſort; becauſe ſo much of the nouriſhment doth not go into the horns. J. M. Eſq. F. R. S. fol. 177.

Sheep without horns the beſt.

§. 8. I carried farmer Miles of Wiltſhire to a field where I had ſome * couples fatting, I told him the ewes were leather-mouthed with thick lips.—He ſaid, they were called with them hants-ſheep; they were a ſort of ſheep that never ſhelled their teeth, but always had their lambs-teeth without ſhedding them, and thruſting out two broader in their room every year.—Being the next day at Mr. Raymond's, I had an opportunity of diſcourſing his ſhepherd, who ſaid, he had been a ſhepherd thirty years; he knew the ſheep by the ſame name, and ſaid, that now and then, in buying a parcel of ſheep, two or three would creep into their flocks, but he never knew of ſo many together as twenty, which at that time I had: he ſaid their teeth would not hold them ſo long as other ſheep, but would wear down to a thickneſs by reaſon of their biting on them from lambs, ſo they ought to be fatted a year the ſooner.—Mr. Raymond being by ſaid, there were ſuch a ſort of horſes called by the name of hants-horſes, that always ſhewed themſelves to be ſix years old.

Of leather-mouthed or hants-ſheep.

* Ewes and lambs.

My ſhepherd bought me a ſcore of couples; when he brought them home he ſaid, they muſt be fatted, for they would not live in our flock, but would be ſtarved: they were a ſmall ſort of ſheep, and out of caſe. I wondered at it, and aſked him how that could be. He ſaid, they were thick leather-mouthed cattle, of which ſort there were many in Wiltſhire and Berkſhire, and therefore they could not bite ſo cloſe as our ſheep, if they went in the flock with them.

§. 9. Mr. Oxenbridge of Wilts ſays, he grew weary of ſending his † hog-ſheep from Michaelmaſs to Lady-day into Somerſetſhire; for, though by that means he brought them home in high caſe, and could maintain them ſo all the ſummer, yet he found they expected as good keeping the next winter, and for want of it would pitch, and not hold their fleſh ſo well as thoſe which had always continued on the farm.—I told farmer Ryalls, and Mr. Biſhop's ſhepherd of this; they ſaid, they were againſt ſending hog-ſheep abroad, if there was land to maintain them in the winter without pinching the flock; for, if the winter proved hard, they would often be cheated of their meat, and be neglected abroad: but a hog-ſheep ought to be kept up well the firſt winter, to be brought into good bone and limb; for, if a † thief be not kept up well, and ſhould pitch in yeaning-time, unleſs you take her lamb from her, and put it to an ewe, it is odds but you loſe both thief and lamb; for it will

† Young ſheep ſhould be well kept.

† Young ewe of the 2d year, called alſo a two-teeth.

bring the ſkenting or ſcouring upon her and kill her; and it is a very good way to put a thief's lamb to an ewe that has loſt her lamb; for the ewe will maintain it well, and ſhe is paſt improving, but the thief will thrive much the better for having the lamb taken from her.

A free-martin ſheep.

§. 10. Mr. Biſſy ſays, an ewe-ſheep that is a free-martin, beſides the piſſed ſtinking tail ſhe carries, has a leſſer and lanker bearing than other ſheep.

Farmer Collins of the Iſle of Wight aſſures me, there are free-martins in ſheep both male and female; he has for a fancy ſometimes kept one of each four or five years: he ſays, they will ſtink like a goat if you come near them, ſo that one can hardly bear the ſmell; and the female does not piſs as other ewes do, but her piſs comes dribbling from her, and the piſs of the male runs dribbling down along his yard.

Of ewes not taking ram.

§. 11. Being at the fold with my ſhepherd, he pointed at an ewe, ſaying, what a fine ewe there is! her tail is apt to be ſo rough, and loaded with wool, that next ramming I will clip her; for ſaid he, I believe that laſt year the ram could not ram her for that reaſon.—I obſerved indeed her buttocks to be wadded with wool.—That year (anno 1702) I had about thirty of my beſt ewes that went through and proved barren, which might be for the aboveſaid reaſon; for I keeping my ſheep very well, they might by ramming-time carry too much wool on their buttocks: the year before I alſo had about twenty proved barren.

In incloſures, when ſheep are dear, an ewe-fold pays better than a weather-fold.

§. 12. Diſcourſing with a farmer in the Iſle of Wight about ſheep, I ſaid, now (in November 1718) ſheep being dear, an ewe-fold would pay better than a weather-fold becauſe of their increaſe.—To which he replied, it was undoubtedly ſo, in caſe the ſheep went in incloſures, where one could give them their bellies full; but in caſe they go on common downs or fields, then of neceſſity one muſt keep weathers, becauſe they can fare hardier than ewes, or elſe your neighbour's flock will ſtarve your ewes.

Of ewes an weathers.

§. 13. The ewes muſt be well kept all the winter and better than the weathers: a weather's wool is of much leſs value than the wool of an ewe, and will ſcarce pay for his winter's keeping, but his tail in folding on the barley in ſpring, when the ewes muſt not be folded, will turn to better account.—Weathers among a flock of ewes will thrive better than by themſelves, becauſe they will beat off the ewes, and have the top of the graſs in ſummer, and the beſt of the hay in winter.

Of buying ſheep for fatting.

§. 14. In buying ſheep for fatting at the firſt hand of the year in ſpring, one may be pretty ſecure of buying in thoſe that will thrive, inaſmuch as ſheep, which ſeem forward in caſe early in the ſpring muſt be of a thriving ſort, otherwiſe they could not be forward in fleſh ſo early: but for the ſecond fatting it is not ſo certain, foraſmuch as ſheep may be in good caſe at Midſummer, and yet have been a tedious while in arriving to that condition, and conſequently will be ſo in their progreſſion.

Of rubbing ſheep's eyes with ſalt.

§. 15. My neighbour's ſhepherd aſked me, if I knew how to make rotten ſheep ſound; on which I inquired of him, if he knew how to do it; he ſaid, to rub their eyes with ſalt would deceive the buyer, and make the whites of their eyes look curious and red; that practice, ſaid he, is common among the ſheep-jobbers.—Afterwards I aſked farmer Elton about it; he ſaid, he had heard that the ſheep-jobbers did uſe it.

Of making ſheep to appear like folded ſheep.

§. 16. Sir Ambroſe Phillipps's ſhearers ſaid, it was a common cheat about them, to get reddiſh clay, and diſſolve it in water, and colour the ſheep with it, and two or three hours after, when it was dry, to card their wool on their backs, to make the buyers believe they had been folded-ſheep, and not paſture-ſheep; for folding the ſheep on the fallows gives their wool that reddiſh colour; and in caſe the ſheep were foreſt, or paſture-ſheep, many would not buy them, becauſe being not uſed to a fold, nor fallows, they would not be able to keep them in either, but they would break away.

Of lean ſheep being dear in June 1707.

§. 17. Lean ſheep ſell well at this time (June 8, 1707) though the ſpring and ſummer-part of the year to the 22d of May (when rain fell) has been the drieſt in the memory of man; I was at a loſs for the reaſon of this whilſt in Hampſhire, which is a breeding country of ſheep, but when I came into Wiltſhire a grazing and fatting country, I ſoon ſaw the cauſe of the dearneſs of lean ſheep; for it ſeems, a greater demand had been for their fat lambs for three years laſt paſt than ever was known, and greater droves of them carried to London, and when the ewe-lambs were fatted, the ewes were conſequently fatted too, and this extraordinary conſumption has waſted the breed of ſheep, and conſequently raiſed the price of lean weathers, but eſpecially of ewes. — In diſcourſe afterwards with Mr. Biſſy on this ſubject, he allowed there had been greater drifts of lambs ſent to London for theſe three years laſt paſt than uſual, the reaſon of which was the breed of ſheep greatly increaſing, becauſe there had been no rot, which moved farmers to fat lambs, becauſe ſheep were like to be cheap; but, ſaid he, the aforeſaid reaſon is not the only one, why lean ſheep are dear, but the drought is the chief reaſon, for no rain falling till the 22d of May, and dry weather following, graziers bought ſheep, fearing they ſhould not be able to fat greater cattle, graſs being ſo ſhort, and the ſeaſon of the year ſo late.

Marks of a proper or improper ram-lamb.

Being at the fold with my ſhepherd, I aſked him, what ram-lamb he would ſave for a ram; he pointed at one, which he ſaid was deep-wooled behind, and had broad buttocks.—That is true, ſaid I, but yet I do not approve of him, becauſe he is ſo wide-headed, that is, his horns ſtand ſo wide, which may endanger the ewes in yeaning by bringing ſuch lambs of the breed, as I have often heard it obſerved by old experienced ſhepherds.—He admitted this to be a proper objection.

A large Lincolnſhire tupp, improper for ſmall ewes.

§. 18. At Loughborough Capt. Tate was ſaying, that he would buy him a Lincolnſhire tupp to improve his flock.—Major Hartop was there, and bid him have a care that he was but of the leſſer ſize, otherwiſe his ewes might die in yeaning, unleſs they were large ſheep. The next day I met Mr. Clerk with Captain Tate, and he ſaid the ſame thing. We ſee it happens to little lap-bitches often if lined with a great dog.

Of the choice of a ram--from the antient writers.

§. 19. [a]Palladius, Columella, and Pliny, ſpeaking of the choice of a ram, direct us, not only to have a regard to the whiteneſs of his wool, but to his palate, and the veins under his tongue, for, if theſe are black or ſpotted, according to their notion, the lambs that proceed from him will have black or ſpotted fleeces.

[b] Other qualities required in a ram, as delivered by the antient writers, are theſe. His figure ſhould be ſtately and tall, his belly big, ſwagging, and woolly, his forehead broad and well frizzled, his eyes of a haſel-grey, encircled thick with wool, his breaſt, ſhoulders, and buttocks broad, his tail very long and fleecy, his teſticles huge, the ringlets of his horns circling inward. Not that a ram, ſays Columella, is more uſeful for having horns, for the beſt are thoſe that have none, but becauſe one of this kind is leſs * hurtful than thoſe, whoſe horns are more open and extended: in climates however that are cold, wet, and ſubject to ſtorms, we rather recommend the largeſt headed rams; for the greater and more ſpreading the horns, the more will their heads be covered and protected from the weather.

* Probably to the ewes in yeaning.

Of a ram, and the proportion of males to females.

§. 20. Mr. Biſhop's ſhepherd ſaid, that they reckoned a ram would ſerve thirty ewes, though they uſually kept two or three rams over and above to their flock: they kept their rams well againſt ramming-time, but afterwards turned them out to the hardeſt fare; and if the ewes warped, they turned them out to the rams again, and they would bring lambs again about St. James-tide. The above is a large proportion of rams to ewes, for a good ram will very well ſerve no leſs than ſixty ewes.

Mr. Biſhop ſaid, he knew how not to be deceived in a fair by a ram that had his ſtones in his back, for a weather; for he had a thicker noſe, and was ram-headed.

Jacob preſented to his brother Eſau 200 ſhe-goats and 20 he-goats, 200 ewes and 20 rams, 40 kine and 10 bulls, Geneſis, cap. xxxii. ver. 14 and 15. — Quære, whether that might not be the proportion of males allotted to females in thoſe countries.

Ewes in the hill-country not to be put to the ram till two years old.

§. 21. Mr. Bachelour of Aſhmonſworth is much for keeping the ram from the hog-ſheep till they are two years old; for, ſays he, they make the only ſheep for our hill-country, but hog-ſheep in our hill-country make very ill mothers, unleſs extraordinarily kept. Columella recommends an ewe of two years old. Elige ovem bimam.

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[a] Cujus coloris ſub linguâ habuere venas, ejus & lanicium eſt in fœtu, variumque, ſi plures fuere. Plin. lib. 8. cap. 47.—Non ſolum ea ratio eſt probandi arietis, ſi vellere candido veſtitur, ſed etiam palatum atque lingua concolor lanæ eſt; nam cum hæ corporis partes nigræ aut maculoſæ ſunt, pulla, vel etiam varia naſcitur proles. Colum. lib. 7. cap. 3. Pallad. fol. 101.

[b] Sint fronte lanâ veſtiti bene, ravis oculis lanâ opertis, auribus amplis, pectore & ſcapulis & clunibus latis. Varro, lib. 2. cap. 2.

Habitus autem maximè probatur, cum eſt altus atque procerus, ventre promiſſo atque lanato, caudâ longiſſimâ, denſique velleris, fronte latâ, teſtibus amplis, intortis cornibus; non quia magis hic ſit utilis (nam eſt melior mutilus aries) ſed quia minimè nocent. Quibuſdam tamen regionibus ubi cœli ſtatus uvidus, ventoſuſque eſt, arietes optaverimus vel ampliſſimis cornibus, quod ea porrecta altaque maximam partem capitis à tempeſtate defendant. Colum. lib. 7. cap. 3.

The farmers are apt to give their ewes they ſell at St. Leonard's the ram at Bartholomew-tide and early that they may thrive on it before they come to the market.

Of ewes being rammed by ram lambs.

§. 22. I was ſaying to farmer Lake of Faccomb, Hants, that I wondered how my rams could break out, and get to my ewes, and ram them, becauſe we coupled them together, and kept them in cloſe incloſures, and yet they muſt get out to the ewes, becauſe twenty of them had lambed a little after Chriſtmaſs.—The farmer ſaid, I ſuſpect ſome of your forward ram-lambs might ram them, they not being ſeparated from the ewes, for ſuch ram-lambs will ram the ewes; I myſelf, ſaid he, had forty ſo rammed: and thoſe ram-lambs of yours, which were lambed at Chriſtmaſs, will ram your ewes again, if not ſeparated as ſoon as the rams are.

Colour of the lamb mark of the ewe's health.

§. 23. Farmer Ryalls of Dorſetſhire walking with me in Mr. Biſhop's ewe-leaſe, he went up to a lamb not long lambed, that was of a yellowiſh hue, ſo coloured I ſuppoſe from the ewe: he ſaid ſuch a colour argued, that the ewe was in good heart and caſe, but if the lamb when lambed was of a greeniſh or blackiſh caſt, or of a pale white, it was otherwiſe.

Mark of the good caſe of ſheep.

§. 24. In walking he turned up ſome of the ſheeps-dung, which was of an intire clot, with only one or two foldings in it: he ſaid, and ſo did Mr. Biſhop's ſhepherd who was with us, that it was a ſign ſuch ſheep were in good caſe, and had their bellies full, whereas, if their dung came away in pellets it was otherwiſe.

Sign of an ewe's being near lambing.

§. 25. Cows and ſheep will fall away, and look hollow in the flank, a day or two before they calve or lamb, as if they had done ſo: and cows will always pitch upon their rump, that is, have more hollowneſs there than any where elſe.

Of tailing the ewes.

§. 26. Tailing the ewes in the ſpring-time, that is, cutting away the wool from under their tails, and their udders, is very proper, eſpecially in deep and fatting countries, where they fat their lambs, and do not fold: it keeps their udders ſweet and free from chopping by the heat of their urine, ſo that the ewe may the better bear the lamb's ſucking her, for her udder being ſore, ſhe will not let the lamb ſuck, but will wean it; and the ſweeter her udder is, the better will the lamb like to ſuck it; whereas otherwiſe the lamb will be apt to take to graſs, and wean itſelf, whereby a lamb intended for fatting will be prejudiced.

Of the care of ewes, and lambs.

§. 27. In lambing-ſeaſon the hill-country ſhepherds have a hard time of it, being obliged to watch the ewes ſometimes for a month together, every night of the week, leſt they ſhould be frozen to the ground: it is ſometimes very troubleſome to make the young ewes of a year old to take notice of their lambs: if ewes are not wintered well, they will never have good lambs, but raſcally ones, it is all in all to feed the ewes ſo, that they may bring good lambs.—Oftentimes they are forced to give the lambs milk, which if not boiled, will carry them off by a looſeneſs.—The warmer part of the downy hill-country allow three tod and an half of hay to the wintering of one ſheep, and ſuppoſe the half tod to anſwer the accidents of a ſeverer winter than ordinary, but at

Crux-Eaſton it is neceſſary five tod ſhould be allowed to every ſheep; for the winter is longer at Crux-Eaſton than moſt part of the downs, it lying under ſnow ſometimes a fortnight, or a month together, when the other downs are free from it.

About lambing-time when they hurdle up the ewes new fallen in the mead at night, it is cuſtomary for them to go forth at midnight, and to ſtir up the ewes; for ſome ewes will be ſo lazy as not to riſe all night, and then their lambs will be almoſt ſtarved by morning, whereas when they are thus raiſed, their lambs will have opportunity to ſuck.—By that means alſo a lamb may be ſaved, which the ewe could not lamb without help; and ſometimes a lamb will be ſaved, which was in danger of being loſt, by getting out of the fold between the hurdles. [c] The antients laid a great ſtreſs on the attendance and care of the ſhepherds at yeaning time, and Palladius adviſes to put the lamb to the teat as ſoon as it is fallen, but to take the beaſtings from the ewe firſt, leſt they ſhould be hurtful to the lamb.

Of ewes taking ram.

§. 28. My ewes not lambing ſo faſt after they had begun in March (anno 1702) as uſually, I was ſpeaking of it to my ſhepherd: he ſaid, he believed it was, becauſe we ſolded them late in the year, on the cold wheat-land, after it was ſowed, which made them not take ram ſo faſt.

Knotted ſheep often bred from horned, &c.

§. 29. Mr. Biſhop ſays, he ſees no difference between the horned and knotted ſheep; if he ſees a fine lamb of the knotted ſheep he keeps him, though his flock be horned: he ſays, he has often a knotted lamb from the horned ſheep, and a horned lamb is often bred from a knotted ewe;—and ſometimes a black lamb from a white ewe and ram.

The firſt lamb generally pot-bellied.

§. 30. It is to be obſerved, that the firſt lamb an ewe brings is generally potted, that is, pot-bellied, ſhort, and thick, which is not ſo good a lamb as the long ſtraight-limbed lamb is; [d] the antients ſeparated theſe from the reſt of their flock, as being of a weak nature, and not ſo long-lived as thoſe that came from older ewes.

Of cows-milk for lambs.

§. 31. It is adviſeable to be provided with a cow with calf in winter, that the weak and ſickly lambs may have milk in the ſpring; and the offall hay the ſheep make will fodder her; but, if ewes are kind to their lambs, and have milk enough for them, it is better not to give them cows milk; for it does not agree with lambs ſo well as ewes milk, but is apt to ſcour them, for which reaſon they uſually boil it.

Of recovering chilled lambs.

§. 32. If a lamb, when firſt lambed, is overcome by the hardſhip of the weather, wrap it in a wiſp of ſtraw, and bring it to a hay-reek, and it is ſtill better if it be in a ſheep-barn, where the ſheep may go round it; thruſt the lamb into a warm hole of the reek, and in a day's time, if any thing will, it will recover the lamb, and then you muſt bring the ewe to it, that it may ſuck: the reek is much more ſuitable to the nature of the lamb than the fire-ſide.

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[c] Paſtor partus pecoris non ſecus ac obſtetricum more cuſtodire debet; neque enim aliter hoc animal quam muliebris ſexus enititur, ſæpiuſque laborat in partu.—Columella, lib. 7. c. 3.—Agnus ſtatim natus uberibus maternis admovendus eſt: manu prius tamen exiguum lactis, in quo ſpiſſior eſt natura, mulgendum, quod paſtores coloſtram vocant; namque hoc agnis, niſi auferatur, nocebit. Pallad. in calendar. Novem.

[d] Oviculas ex primiparis natas abalienare oportet, ceù minimè diuturnas.—Didymus in Geoponicis, ſol. 450. Primiparis minores fœtus. Plin. lib. 8. c. 47.

Of the care of lambs.

§. 33. The main care to preſerve lambs at yeaning-time, if ſnow ſhould fall, is to bed them with ſtraw. A young ewe will be ſhy of her lamb by reaſon of the tenderneſs of her udder: the young ewe, being forward, muſt be kept hurdled up for a day and a night, till ſhe takes to her lamb, in the ſame manner as when a ſtrange lamb is put to an old ewe.

When Mr. Biſhop's ſhepherd had tamed an ewe that he had tied up to a ſtrange lamb, he uſed, when he let her out, to tie her hinder and her fore leg together with a ſtring, that ſhe might not run away from her lamb.

If an ewe warps her lamb before her time, or the lamb comes at it's full time, but in an ill condition, or dead, it ſeems improper, to me, to put a twin-lamb, or a thief's lamb to ſuch an ewe; for ſuch an ewe's milk will not be kindly, nor will the lamb thrive; but, if the lamb comes at full time and ſound, though dead, or is afterwards killed by an accident, then ſuch uſage is very good, and I have done accordingly.

If any good ewe loſe her lamb by a fox, or weaſel, or other accident, the ſhepherd ought to ſet a thief's lamb or twin-lamb to her: the lamb's head to be wiped with the ſheep's green tail, till brought to it's nature; and

If there be no lamb in that flock to ſpare, a lamb ought to be ſought in a neighbouring flock.

In lambing-time always put thoſe ewes that brought twins apart by themſelves; becauſe, if you let them go with the other ewes and lambs, they are apt to loſe one of their lambs, till they are a little ſettled with them.

[e] Palladius ſpeaking of the ewes that have newly lambed, ſays, the lamb ſhould be ſhut up with the ewe for two days.

Of weaning lambs.

§. 34. As to weaning of lambs, in ſome places they never ſever the lambs from their dams, eſpecially in the beſt paſtures, where the ram goes conſtantly with the ewes; becauſe, when the ewe goes to ram again ſhe will go dry, and wean her lamb herſelf; and in unſound paſture they reckon it beſt for lambs to run with the ewes, becauſe they ſeldom rot while they ſuck, unleſs the ewe's milk fails. J. Mortimer, Eſq. F. R. S. fo. 179.

Of care in catching a lamb.

§. 35. The butcher coming to kill me a lamb, which I helped to catch, I held it up by the back to weigh it; and, when he had killed it, I obſerved the blood, where I had griped the lamb on the back, was already ſettled in a bruiſed manner, though killed immediately upon it.—He ſays, it neither hurts calf nor lamb to catch it by the hinder leg.

Of cutting lambs.

§. 36. They uſed at Crux-Eaſton formerly to cut their tup-lambs early, within ſix weeks old; but of late (anno 1697) they have put it off to St. James's-tide, becauſe they find the lambs, when ſo old before they are cut, carry a better head for it.—In Wiltſhire they cut them at ſix weeks old.—The Wiltſhire farmers judge it is hard to keep the wound from the flies, when cut ſo far on in the ſummer.

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[e] Per biduum natus cum matre claudatur. Palladius, fol. 118.

Id. and of ſpots on lambs thighs.

Farmer Farthing of Appleford in the Iſle of Wight, who had in April (anno 1700) newly cut his lambs, aſſured me, that ſeveral of the lambs would have under their legs, on their thighs, red ſpots in the fleſh or ſkin, as big as the top of one's finger, and if they cut ſuch lambs they would moſt certainly die in leſs than twelve hours; nay, ſaid he, if ſuch lambs be but ſlit in the ear or ear-marked, ſo as blood be drawn whilſt they have thoſe ſpots, they look on it that they will die: but three or four days after thoſe ſpots appear they will go away, and then they may be cut:—he had half a ſcore that he forbore cutting at that time for that reaſon.—He ſays, in the iſland they cut the lambs in the beginning of April at fartheſt, that they may cut them before theſe ſpots come forth, for they obſerve the ſpots to come forth when the hawthorn buſhes begin to bud.—To all theſe points farmer Glyde did agree, and ſays farther, that, if they had no ſpots under their thighs, yet, if they were in their bodies, which was not to be ſeen, it was the ſame thing; for he had loſt lambs, and when he had flead them, he ſaw the ſpots.—Farmer Farthing's ſhepherd caught me a lamb or two to ſhew me the ſpots, which were like a bloody ſcurvy-ſpot.

In the iſland they approve of cutting lambs and not of girding; becauſe girding makes them not limb ſo well in their thighs, nor be fat there, when they come to be fatted.

When I diſcourſed my ſhepherd, and farmer Elton about the red ſpots under lambs thighs, and told them, in the iſland they all looked on it to be mortal to cut a lamb at that time, I aſked, whether they did not obſerve the ſame about them. I found they had heard ſomething of it, but ſaid, the method in their country was to ſear, and if it be dexterouſly done, no blood will be drawn, nor do they regard whether they do it when the ſpots are on the lambs or not.

Sir Ambroſe Phillipps's ſhepherd knew nothing of the red ſpots under lambs thighs, and yet cuts them about the beginning or middle of April; he obſerves not the ſign, nor thinks it ought to be regarded, only he takes care not to cut them when the weather is too hot, nor in wet weather; for the wet falling on their loins at that time, is apt to give them cold.—He ſays, it is a common opinion amongſt them, that if a man cuts lambs who has a ſtinking breath, or that takes tobacco at the time, either of theſe will poiſon the place, and make it apt to gangrene.—An Iriſhman, coming to Sir Ambroſe's to buy mares and rams in that country for breed, wondered to ſee the ſhepherd cut his lambs on a day when the wind was northerly, and ſaid, they ſhould in Ireland look on it to be certain death to the lamb, if cut on ſuch a day.

Formerly the butchers uſed not to like ſearing, but would have the lambs be drawn becauſe it hurt the leg of mutton, it never being full there, which was true as they then managed it; but of late we find ſearing to be the ſafer way, and to put the lamb to leſs pain than drawing, and we now prevent that miſchief by ſearing as little of the cod away as poſſible.

The butchers aſſure me, that a pur or ram-lamb will never be ſo fat for the butcher as an ewe-lamb: they ſay, the pur-lambs I intend to fat ſhould be drawn as ſoon as they are a fortnight old; they would fat much the better for it; and if I ſhould keep them to be weathers, though they will not run ſo much to a head as thoſe that are cut or drawn later, yet they make better mutton.

June 3d (anno 1702) I cut my pur-lambs, the weather being very hot, and they ſeemed to my ſhepherd to do very well that night and all the next day, not being able to come to the pond to wet themſelves; the third day they had the liberty of the pond, when he obſerved, they would take the water, and even ſwim, they went in ſo deep: that week I loſt ſix of them, which died of the rankling of the cutting: I had at the ſame time ten lambs cut, which went by themſelves from the flock, being twin-lambs, but they could come at no water, and theſe did very well.—Therefore it may be ſhrewdly ſuſpected that the other lambs rankled from their running up ſo deep in the water, and that they ſhould be kept from water, eſpecially in hot weather, for three or four days after their being cut.—Mr. Edwards aſſures me, he has often heard that going into the water was very dangerous for new cut lambs;—but farmer Bond ſays, he keeps not his from water, nor has he found that it hurts them.

Mr. Biſſy draws the ſtones both of his calves and his lambs himſelf with his teeth. I wondered at it, becauſe it ſeemed at firſt, as if he thought touching the ſtones with the hand or an inſtrument might not ſucceed ſo well; but he ſaid, the only reaſon he knew of was, becauſe by the help of his teeth one man could do two men's work; for whilſt he draws the ſtones with his teeth, he has his two hands at liberty to hold back the ſtrings of the ſtones that they are not drawn away; for the ſtrings run up into the loins and backbone, and if care be not taken to keep them back with both hands, the ſtones would draw the very cawl after them, and then the lambs muſt die; therefore the way is to draw the ſtones leiſurely with the teeth, that you may be ſure to hold the ſtrings from drawing after.

Mr. Biſhop ſays, in Dorſetſhire they cut not their lambs till the latter end of May. I aſked him the reaſon of it. He ſaid, they kept them the longer from cutting, that they might be able to fold on the barley-grounds, which they would not be, if they were cut in March: their great fair for pur-lambs at Sherbourn is in July.—They have three ways in Dorſetſhire for cutting lambs; by cutting and ſearing; by ſwigging, which is girding them hard round the cods, and cutting the cod away cloſe to the ſtring; they know whether it be well done or not by it's not bleeding afterwards: and thirdly, drawing, which is done by making a ſlit in the cod as wide as an half crown, and drawing out the ſtones, which will bring away with them a back ſtring, and ſtuns the poor lamb for the time: if this way kills them, it is in two or three days time, but in ſwigging they will die ſometimes a month after: Mr. Biſhop uſes drawing, and ſays it is the beſt way: and ſo ſaid another farmer.

About Holt they cut their lambs at a fortnight or three weeks old, though they ſhould fall at Chriſtmaſs; and then, ſays Iſles and William Sartain, they will eat as ſweet as the ewe-lambs: they take care to cut them in dry or froſty weather, and not in wet, and to keep them walking after it, and to raiſe them up three or four times, and keep them ſtirring that day they are cut.—Note, they all draw their lambs-ſtones with their teeth, which is the only way if you intend to fat them.—They ſay, it is ſo eaſy to do, that any one may do it.

They adviſe me to put my ewes to ram, in caſe I would fat my lambs, ſo as to come the latter end of January, or, conſidering the coldneſs of our country, in the middle of February.—William Sartain ſaid at another time, that he ſcrupled not to draw the ſtones of his lambs at four or five days old, if they were come down, ſo as to take hold of them, and had commonly done it, but never loſt any.

The north country, as Lincolnſhire, and thoſe counties that ſend their knot-headed lambs (i. e. not horned ones) to Smithfield market, (they being great lambs of large-ſized ſheep) do not ſend their lambs to London till about Midſummer, and hold on ſending till about Bartholomew-tide; thoſe lambs are coarſe, eſpecially the males, becauſe they do not geld them, though they fat them, which makes them the larger; for they agree, that gelding them makes them of leſs growth, though the meat is the ſweeter for it.

Of fatting lambs in Eſſex.

§. 37. Mr. Clerk was telling me how they managed their lambs in Eſſex to ſell them ſo fat in the London markets, as they do before Chriſtmaſs; he ſays, they keep their ewes as high as ever they can, and houſe their lambs, and bring in the ewes to them at ſix in the evening for all night, and turn them out at ſix in the morning till nine, and then take them in again, and turn them out till ſix.—But as ſoon as an ewe's lamb is fatted off, and ſold, they keep ſuch ewes to ſerve the lambs that are left; the ewes that feed all night are taken in in the morning about nine, and then the mother-ewes are not called in in the day-time: the foſter-mothers are held whilſt the lambs ſuck: all the time of fatting the lamb has it's bed of ſtraw changed once or twice in twenty-four hours, and a chalk-ſtone to lick on.

Of ewes bringinglambs twice a year.

§. 38. Virgil ſeems to be wraped up in his poetical ſpirit when he triumphs on the fruitfulneſs of Italy, and ſays,--" that the lands bear two crops in a year, and the ewes lamb twice." By which he muſt mean, that the ewes ſo lamb twice in a year, as to bring up their lambs to a marketable condition, within the compaſs of the year, that is, ſo as to have taken their weaning, or be fit for the butcher; otherwiſe if he means, that their ewes bring lambs twice within the compaſs of the year without rearing them, he ſays no more than what is common throughoutt he world.—The Rei ruſticæ ſcriptores ſay, " that when the ewe takes ram again, ſhe will wean her lamb." But it ſeems this expreſſion of the Rei ruſticæ ſcriptores is generally to be underſtood; and doubtleſs, according to the common condition of flocks, the ewes are not in ſo good caſe as to ſuckle one lamb and breed another, and therefore will, if with lamb again, wean the ſucking lamb. — But it happened otherwiſe with farmer Stephens, my tenant, for he had three ewes that went in good paſture, which brought him lambs at Chriſtmaſs, which he ſold fat to the butcher at Lady-day laſt (anno 1707) and at the beginning of June thinking his ewes to be mutton, for they looked big, he went to ſell them to the butcher, who handled them, and found their udders ſpring with milk, and that they were near lambing, and accordingly did lamb the firſt week in June: and this his neighbours know to be true.—Theſe ewes being well kept, did in this caſe, it is evident, take ram three months before they weaned their firſt lambs: and theſe ewes had always been uſed to bring twin-lambs, and ſo of a more fruitful ſort, though in this caſe they brought but ſingle ones.

I am informed from Dr. Sloan, that in Jamaica ewes bring forth twice in fifteen months, without any regard to the time of the year, but cows as in Europe.

Time when lambs, &c. are eatable.

§. 39. When God demands the firſt-born of cattle for himſelf (Exod. xxii. 30.) he ſays, "ſeven days it ſhall be with it's dam, on the eighth day thou ſhalt give it me." On which Dr. Patrick remarks, "that till then the young were not of a maturity, nor accounted wholſome."—To which I muſt add, that they are not ſo by that time in our cold country in England, where a fortnight is the ſooneſt we think well of ſuch creatures for eatables: but it is very reaſonable to believe they were maturer in half that time in Judea; for it is apparent to me, on experience, that ſucking-pigs, and lambs, and calves thrive much faſter in England in the hot months of the ſummer, than they do in winter.

OF SHEARING SHEEP.

To let ſheep cool before they are waſhed.

§. 40. Being on the 4th of June (anno 1701) to waſh our ſheep on the morrow, I aſked my ſhepherd, what time in the morning he would drive them to the waſh-mills; he ſaid, they ſhould not begin waſhing perhaps till ten, but he would begin to drive them by five in the morning, or earlier, that the ſheep might have time to cool after they came there, before they were waſhed, otherwiſe it might make them ill.

Not to waſh a fat ſheep you intend to kill in a week after.

§. 41. Going along with my ſheep to waſhing, my ſhepherd aſked me, if I ſhould in a week's time want to kill a fat ſheep, becauſe if I did, ſaid he, I will not waſh him; for the tumbling and rubbing the ſheep damages the mutton, if killed ſo ſoon after, but it is never the worſe for it in a fortnight's time.

Manner of waſhing ſheep near Graveſend.

§. 42. In Kent, near Hiam-kill-marſh-prieſt, about ten miles beyond Graveſend, they waſh their ſheep in the following manner;—there being creeks, that are muddy, when the tide is down, but, when the ſea flows, are deep in water, they tie ropes to three or four ſheep of the flock, and hall them over, the reſt willingly following, and then the ſaid ſheep are drawn over again in the ſame manner, and by the time they have ſwam over ſeven or eight times, which is as often as they well can do in a tide, they will be well waſhed:—and this waſhing, they ſay, is preferable to our ſcouring and rubbing them:—from hence it appears the ſalt water is not pernicious to their wool.

Waſhing ſheep in Leiceſterſhire.

§. 43. I aſked Sir Ambroſe Phillipps's ſhearers, if they did not reckon a ſlow-running water better to waſh the ſheep in than a quick-running ſtream, becauſe it ſcoured better.—The ſhepherd ſaid, he had heard it ſo reckoned, but he rather liked a ſharp ſtream, for if it did not ſcour ſo well, yet it left not that oily ſmell behind it that the other was apt to do, which would invite flies to blow the wool between waſhing and ſhearing.—The ſhearers ſaid,—they believed they could not waſh their ſheep ſo clean as we could at Crux-Eaſton, becauſe their ſheep went much on a ſandy ſoil, and the grit of that would not waſh out ſo well as the clay.

Of ſhearing ſheep's tails in the Iſle of Wight and Hertfordſhire.

§. 44. Coming over Appleford-common in the Iſle of Wight, I obſerved the tails of the weathers ſheared cloſe all along down from the rump, ſo that their tails hung down like rats-tails: I inquired the meaning of it, and was anſwered, that they always did ſo in the Iſle of Wight both to weathers and ewes, becauſe they ſo bepiſſed their tails, that it burned and ſcorched up their dugs.—They ſometimes began to do it in the beginning of April, ſometimes not till May, according as the ſeaſon proved.—My bailiff ſays, they have the ſame cuſtom in Hertfordſhire.

Of care in ſhearing ewe-lambs.

§. 45. Shearers ought to go very ſoberly and carefully to work, leſt they cut off the ewe-lamb's teat, and yet, be they never ſo careful, that may ſometimes be done; and in ſuch caſe they ought to take care to mark ſuch a lamb, that it may be fatted.

Of care, that ſheep may not ſcour between waſhing and ſhearing.

§. 46. I was talking of driving my ſheep into a lay-ground of freſh graſs after waſhing, and before ſhearing: but many that were preſent ſaid, by no means; for that would ſcour them, and foul their wool; and alſo, when drove into the barn, they would be trampling in their dung and daub themſelves; therefore, ſaid they, we take care to give them the ſhorteſt paſture, after waſhing till ſhearing, we can get, that their dung may be pellets.

Of pricking ſheep in ſhearing.

§. 47. In ſhearing the danger is, leſt any of the ſheep ſhould be pricked with the ſhears, which if done, and not taken notice of, ſo as to cut it out with the ſhears, it will be apt to rankle, and kill the ſheep in twenty-four hours time; but cutting does little or no prejudice if tarred.

Of ſheep being ſmothered in the ſhearing-barn.

§. 48. The night before ſhearing we drove the ſheep into the barn, leſt rain ſhould come: my ſhepherd, and thoſe who helped him were in fear leſt any of them ſhould be ſmothered, and therefore they ought to be looked to, to ſee they keep their faces in the air.—My next neighbour loſt ſeven or eight in one ſhearing-time, and divers others have had the like misfortune happen.

Fatting-ſheep in incloſures to be ſheared early.

§. 49. Mr. Weedon, and Mr. Cowſlade of Woodhay, uſually ſhear and waſh their fatting-ſheep by May-day: the reaſon they give for it is, becauſe their incloſures are very ſmall, and conſequently too hot, and therefore their fatting-ſheep need to have their coats off ſo much the earlier, and they thrive the better for it.

Of plucking ſheep.

§. 50. [f] It was an antient cuſtom (as the Rei ruſticæ ſcriptores tell us) to pluck lluck the wool from the ſheep's backs, inſtead of ſhearing it, and this cuſtom aſted in ſome places even to Pliny's time, and Varro derives the word vellus, a fleece, from vello, to pluck.

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[f] Oves non ubique tondentur; durat quibuſdam in locis vellendi mos. Plin. lib. 8. c. 48. Et Varro de re ruſtica, lib. 2. fol. 64. ait, Ex vocabulo—vellera, animadverti licet, prius lanæ vulſuram quam tonſuram inventam.

§. 51. I never uſed to ſhear till the Monday before Midſummer-day, but I now (anno 1714) find I was in an error in ſo doing, and that, as my keeping is very good, by which means the wool grows the larger, and heats the ſheep the more, and their fleſhineſs being ſuch as to bear the cold the earlier in parting with their fleeces, I ought to begin to ſhear the firſt week in June; and the ſheep would not only thrive much the better, when the load of their wool was gone, but their new wool would alſo have more time to grow againſt Weyhill fair, which would make the ſheep look more burly. Sheep when ſhorn have better ſtomachs, for the heat of the wool takes away their appetites.

Sheep well kept may be ſheared the earlier.

What in ſcripture is tranſlated the ſhearing-houſe, ſignifies in the original, the houſe of the ſhepherd's binding; for they bound the feet of the ſheep when they ſheared them. Vid. notes on 2 Kings x. 12.

§. 52. Two or three days before my ſheep-ſhearing, I was conſulting with my ſhepherd how to provide barn-room enough to houſe my ſheep the evening before ſhear-day, in caſe it ſhould be likely to rain that evening.—He was very deſirous to have more barn-room than former ſhepherds, to keep his ſheep cool; but had great hopes the weather would be ſo very fair, that they need not be houſed till the morning of the ſhear-day; for, ſaid he, the houſing them over night before ſhear-day, when they are loaded with wool, heats them ſo, that when they are ſheared they catch cold, and will be glandered, and ſnivel very much.

To avoid houſing ſheep if the weather will permit, before ſhearing.

§. 53. The ſhearers agreed, that, if ſheep were poor, it was a great advantage to them to have two or three good ſeaſonable and moderate days of weather after ſhearing, for, if the ſheep were poor when ſheared, and two or three hot days came preſently upon them before they were ſettled, it was wonderful to ſee what alterations it would make on them: their ſkins would turn ſcurfy and ſtarky, and their wool ſtare and grow thin: and, if the weather ſhould prove cold, and exceeding wet, it would quite chill ſuch ſheep; about ſix weeks ago, it being about Midſummer (anno 1699) a mighty cold and wet day and night falling on ſuch ſheep the next day after their ſhearing, they were fetched home dead in dung-pots; but neither of thoſe ſorts of weather had much effect on fat ſheep, or thoſe in very good caſe.

A great advantage to poor ſheep to have moderate weather after ſhearing.

§. 54. I aſked farmer Biggs, Mr. Edwards being preſent, why they ſheared their lambs in this country, and not in our part of Wiltſhire. They ſaid, they judged we folded not ſo much as they: and that lambs being folded and kept hot thereby, it would increaſe their tick which breeds in them; and they obſerved the wool, if let alone, would quite eat out the fleſh of the lamb, and bring it to be out of caſe.

Why they ſhear lambs in Hampſhire and not in Wiltſhire.

§. 55. Many farmers in Hampſhire always let alone ſhearing their ſheep till a week or ten days after the waſhing; it is held that the ſheep's ſweating ſo long in their wool does it good, and makes it weigh the heavier.

Not to ſhear till a week after waſhing.

Id. and of the moth in wool.

Farmer Biggs and I diſcourſing on ſheep-ſhearing, the farmer ſaid, it was a great damage to wool to have the moth, which was chiefly got, eſpecially if the wool was kept above a year, by laying it againſt a ſouth, ſouth-weſt, or other damp wall, or by ſhearing the ſheep before the wool was dry after waſhing.——But, ſaid I, how can one help it? if ſhearing-day be ſet, and it ſhould ſo fall out that much rain ſhould fall between waſhing and ſhearing-time.—Said he, the rule of the country is, that farmers, that uſe the ſame ſhearers, and are to come after, muſt put back their ſhearing-days, that you may ſtay till your wool be dry: but, added he, ſuch hindrance ſeldom happens, for, leſt rain ſhould fall the night before ſhearing-time, they that have barn-room uſe to drive their ſheep in there the night before, or, if rain ſhould fall on them the day before, they will drive them cloſe up into a barn, where their wool will heat, and the wet ſoon be dried up: others will not drive them up into a barn the night before ſhearing, if not likely to rain, but will watch them, leſt rain unexpected ſhould come.—And they that have dry downs for their ſheep to go in, will keep them a week or ten days after waſhing, before they will ſhear them, that the ſheep may ſweat in their wool, which is a very good way; for by the oily goodneſs the wool gets, it will grow till that be ſpent after ſhearing.

On the contrary, Mr. Raymond and his ſhepherd were diſcourſing on waſhing and ſhearing, and propoſed waſhing to be on a Monday, and ſhearing the Wedneſday after.—I aſked if that was not too ſoon; they ſaid, no, the heat of their bodies and the ſun would dry their wool in one day and a night, and that many farmers would ſhear the next day.—The ſhepherd ſeemed to be deſirous of having it done the ſooner, leſt the fly ſhould damage the wool by blowing it: all however agree the wool ſhould be dry before it is ſheared.

Of not marking ſheep till two or three days after ſhearing.

§. 56. In ſhearing the ſheep at Sir Ambroſe Phillipps's, the ſhepherd gave them the ruddle-ſtroke, but not Sir Ambroſe Phillipps's-mark.—I aſked him, how that came to paſs; he ſaid, he thought it was better to let them alone two or three days firſt, for while they were ſo bare of wool they were apt to be burnt with the iron, which would make the place ſore and ſubject to the flies.

OF FOLDING SHEEP.

Of the ſheep-folds of the eaſtern countries.

§. 57. Numb. xxxii. 16. "And we will build ſheep-folds here for our cattle." Which looks as if ſuch huſbandry was in uſe then as is now-a-days. But quære the original, and ſee the 14th verſe, which being compared with this, it ſeems their ſheep were kept in immoveable houſes, not in moveable folds as now-a-days.

Columella ſays, "Quæ circa Parmam & Mutinam macris ſtabulantur "campis." lib. 7. fo. 173.—Therefore it ſeems they had ſome way like our ſheep-folds, and did not truſt altogether in ſheep-coats.

It further appears, that the ſheep-folds of the eaſtern countries were not ſuch as our's, but houſes, to which the parable of our Saviour in the tenth chap. of John has relation, as well as to the uſage of the ſhepherd's going before, and calling the ſheep after him. See from ver. 1. to 5.

Id. in Spain.

Mr. Garret, who has lived four years in Spain, aſſures me, that, in thoſe parts where he was, they fold their ſheep as we do our's, only their fold is made net-wiſe with ſtrong cords, and about ſix feet high with the bottom ſtaked down to the ground, and two cur-dogs, of a breed between a maſtiff and a greyhound, lie within the fold, to guard the ſheep from the wolf.

A weather-flock preferable to an ewe-flock in the hill country.

§. 58. In favour rather of keeping a weather-flock than an ewe-flock on the hill-country, beſides other conveniencies, you may have the benefit of the fold for barley at the principal time when it does moſt good; viz. on the fallows between the latter end of February and the middle of April, when the ewes cannot be folded.

Rules for keeping a flock through winter.

§. 59. The limitation of an ewe-flock for folding and keeping on throughout the winter, or be it a weather-flock, ought to depend on theſe rules; 1ſt, Not to keep more at winter than you can winter either by meads, or ſowed graſſes and hay.—2dly, Not to be ſatisfied that you can provide hay for them by ſowed graſſes, as broad-clover, &c. in caſe ſuch lands, as are fitteſt to carry ſuch graſſes lie at a diſtance for mowing, whereby you muſt maintain them with dung, where, by reaſon of carriage, it will be chargeable, unleſs your fold can maintain more ground than your out-lying lands to your farm, which in the hill-country is not likely: and to carry but ſeven or eight pots of dung in a day, by reaſon of the diſtance, and mowing, is not reaping a profit, but bare exchanging: but, if you have much land round about, and near your houſe, whereto you can carry thirty or forty load of dung a day, and which will bear broad-clover hay, then you may increaſe your flock proportionably.

Not to weaken your flock by drawing out ewes and lambs for fatting.

§. 60. As to fatting your ewes and lambs out of your flock, if you have lands diſpoſed for fatting, you ought to conſider, if you break your flock by drawing out ewes with their lambs for that purpoſe, what flock you will have left to fold on your wheat-fallows, and how far your wheat-land ſtands in need of a fold; for if you leave yourſelf not ſufficient, it will be indiſcretion to weaken your fold; beſides it will hurt your breed; for you will draw off many forward lambs, which might perhaps have carried on the breed otherwiſe, and when a hill-country farmer is ſettled in a flock, it is not good to be buying yearly, to keep up his complement, on account of many damages which may from thence enſue: it is better therefore in ſuch caſe to buy ewes with their forward lambs to put into your fatting-grounds: but in caſe you ſow wheat-land good enough without the fold, or have another way of manuring it, by liming, &c. then it may be very well to fat off certain numbers of your flock.

Of winter-folding, and folding on barley.

§. 61. Though, ſays a very good farmer of my acquaintance, I have but a mean opinion of winter-folding, or to fold on barley ſown, and may in time fallow on graſs-ground inſtead of barley-land, yet I would fold on barley-land fallowed or ſtirred, from the time my lambs were ſtiff enough after lambing to go on ſuch fallows, for, ſays he, the benefit of an acre ſo folded is three times as good as one winter-folded for barley.

Ewes and lambs preferable to weathers for folding.

§. 62. Farmer Glyde of the Iſle of Wight, with whom I was talking of huſbandry affairs, told me, there was one thing he believed I knew not of, which he would tell me; he would, he ſaid, adviſe me to fold my ewes and lambs on the barley-land in the ſpring, and divide my flocks in folding, for, ſaid he, two hundred ewes and their lambs will do as much, if not more, good by folding on an acre of land, as four hundred weathers: I have, ſaid he, folded apart on the ſame land at the ſame time two hundred ewes and their lambs, and in another fold of equal dimenſion five hundred weathers, and I have always found, that the folding of the ewes did me the beſt ſervice, and brought me the beſt corn.

Of folding on barley, &c.

§. 63. My ſhepherd is of opinion, that ewes ought not to be folded on the barley-fallows, or any other fallows in lambing-time, but weathers only; for the lambs being wet when lambed would be dirtied with the fallows, and the ewes would preſently forſake them: therefore the ewes ought in lambing-time to be folded in the meadows, where it is clean, and the folds removed as often as the cold wind ſhould change from corner to corner.—And afterwards, he ſaid, they ought to fold weathers on the barley till a fortnight after May, but the ewes never after Candlemaſs.

It is plain that the early folding an ewe-flock and lambs in April, on wheat-fallows, pinches the lambs, and ſo does folding them at that time on the barley-grounds, both which are too cold for them, eſpecially in our hill-country; care ought therefore to be taken, that thoſe lands do not of neceſſity want folding on in thoſe months, but that they may be otherwiſe provided for, and that during that time the ewe-fold may be on graſs-grounds, or lay-grounds deſigned for fallows.

We muſt be more cautious in April and May of folding an ewe-fold on the barley-land, they being wettiſh, than of folding them on the wheat ſown in Auguſt or September; becauſe the lambs in April and May make the ewes riſe often and move, whereby the ground becomes much more trodden at that time of the year by the ewe-fold, than it would be by a weather fold, or an * hog-fold, as may apparently be ſeen, if the folds be divided.

* Young ſheep.

To drive lambs late to fold, and let them out early.

§. 64. Telling Mr. Gerriſh the great grazier, and farmer Iſles, how dear Mr. Eyres our miniſter ſold fat lambs to the number of fifteen May 18th, viz. for ten ſhillings and ſix-pence each, and that they had been folded all along to the very day he ſold them.—They replied, that folding the lambs did very little hurt them with reſpect to their fat, provided they were drove pretty late to fold, and let out early in the morning.

Of the folding in Italy.

§. 65. Sunt qui optime ſtercorari putent ſub dio retibus incluſa pecorum manſione. Plin. f. 299. So it ſeems this was a folding as we do, unleſs by ſub dio, be meant, by day.

Of folding on wheat in October, and of winter-folding.

§. 66. Walking with Mr. Raymond into his arable-common-fields October 25th (anno 1708) we met his ſhepherd pitching the fold on the new-ſowed wheat.—I aſked him, whether he did not find that pitching the fold on the wheat at this time of the year, and a fortnight later, turned to a much better account than folding for the barley-crop for the year following.—Mr. Raymond and his ſhepherd readily replied, undoubtedly it turned to the beſt account to fold after this time on wheat.—I ſaid, for my part, I had obſerved the fold carried on the land deſigned for barley ſo early in the winter had little effect, it's ſtrength being ſpent and waſhed away by ſpring, ſo that it will make but little ſhew in the crop of barley next ſummer, and that therefore I choſe to preſerve four, five, or ſix acres of wheat-fallow that lies warm, and will bear ſowing late, to carry my fold over to the latter end of October, rather than finiſh my wheat-fold by the end of September, and then carry it on my barley; for though the latter part of October might, in our cold country, be too late to ſow wheat, yet it was better than to be ſo ſoon folding barley, which would be no better for it.—To which they replied, I was much in the right.—And as I have before obſerved how inſignificant the fold is in the winter, eſpecially in hard froſts, I imparted it to Mr. Raymond, who concurred with me, and ſaid, he had folded on arable land in ſnow, and found not the leaſt benefit: whereupon he reſolved in ſuch caſes to fold on meadow and paſture, in mighty expectations of graſs, but it made no return, wherefore in ſnows, he now lets his ſheep ramble.

Of winter-folding in the hill-country.

§. 67. Whereas I have ſaid, that in cold clay-ground, and in a cold high hill-country, a winter-fold does little good, yet I have by experience found the contrary in ſuch parts of the hill-country, where the land is dry and light, and that it does great ſervice to the barley crop.—This difference may be reconciled thus, i. e. where the land, though called hill-country land, does not lie very high, for the height much tends to the chilling of the ground: again, the explanatory reaſon of this difference, though hardly accountable for, yet ſeems to me chiefly to lie in the chilling quality of the ground, which at firſt receives the dung and piſs, and that deadens the ferment; whereas in warmer ground it's progreſſion toward that end is ſupported by a ſufficient benign warmth, ſince in both ſorts of earth the urine does undeniably ſink into the earth and mix with it.

To fold wide in ſpring on cold feeding ground.

§. 68. My ground being cold and feeding, I ſhould in the ſpring of the year, when I come either to pitch my fold on the barley-fallows, or on the ſown barley, ſet it very wide, in order to avoid the uſual inconveniencies of penning at that time, viz. the rankneſs and lodging of the barley, and the conſequences, thinneſs and coarſeneſs.

Caution againſt folding on wheat in wet land ſoon after ſowing.

§. 69. It was the 10th of October (anno 1720) when my fold was going to be ſet on the wheat-fallows of a field, which was heavy land, and the fallows, where the fold was to go, were to be ploughed up the next day; I was afraid the land would be too wet to fold on after the wheat was ſown, and ſpoke to the ſhepherd about it.—He ſaid, he believed I might be in the right, eſpecially ſince the rams had been ſome days put to ramming the ewes, becauſe the rams would keep moving and ſtirring the ewes all night in the fold, whereby the ground would be battered and trod, and ſo ſquatted that the wheat might not get through.

Of penning ſheep on hurdles.

§. 70. That the Greeks did pen up their ſheep that they might piſs through hurdles, as in Herefordſhire, you may ſee in Palladius's calendar, November, to avoid dirting and damaging their fleeces.

Of turning arable to meadow.

§. 71. Farmer Miles, whom I have often mentioned with approbation, adviſed me, if I would turn arable into meadow, and lay it up to graſs, to fling ſtraw upon it that is leſs than half rotten, and then fold upon it the ſame night, and it will bring tbe ground on very faſt.

Of winter-folding for barley.

§. 72. Purſuant to what has been before ſaid, that folding in winter for barley is not profitable, becauſe, by waiting for the fold's running over the land, we loſe the principal ſeaſon of fallowing; yet however it may be proper to fold till Chriſtmaſs, and then go on the wheat-lay; becauſe we can loſe no fallowing ſeaſon by that; we cannot well have finiſhed our fallowing any year before Chriſtmaſs.

Id. in Leiceſterſhire.

I find by Mr. Antill and Mr. Clerk, and others, that in Leiceſterſhire they have no winter-folding for barley; they leave off by Michaelmaſs at fartheſt, and ſometimes cannot fold again till May; the reaſon is, their lands are ſo wet they would be always in a poach, and the coldneſs of the lands would kill the ſheep: to help which defect, they * muck their barley-lands, and from thence begin their huſbandry, and ſow wheat the year after, often under furrow, on their barley-ſtubble, for they ſay, if they ſhould dung their wheat-ground it would rot their wheat, and they ſow peas or beans after the wheat, and then lay the ground to ſummer-fallow again, to be mucked in May for barley, or to fold for wheat; ſo that they carry out their dung before it is half rotten, or the ſeeds of the weeds killed: but in their incloſures they ſow four crops of corn all on one earth, without dung, for the moſt part beginning with oats, and laying down to graſs with wheat.

* Dung.

Folding in Dorſetſhire.

§. 73. I am told, that in Dorſetſhire the aim of the farmers is, to fold on their ſheep-leaſes in the middle of July, and ſo till Michaelmaſs, that in the winter there may be a good head of graſs for the milch-ewes.

Of folding unſeaſonably.

§. 74. It ſeems to be incovenient to graſp at ſo large a wheat or barley-crop, as hardly to be able to compaſs it without folding late on the wheat after it is ſowed, or on the barley-land after it is ſowed; for by being under the above neceſſity, in order to compaſs what one has engroſſed, one may often be obliged to fold unſeaſonably on each ſort of corn, nor will the fold in that caſe make good the damage done to the flock by the lateneſs of the ſeaſon: and an ewe-fold is often damaged by folding on the cold land at the latter end of October; whereas it is better to come early with your fold off of the wheat-lands on to the barley lay-grounds, and from the ſowed barley on to the wheat-fallows; for thereby you will fold the ſame quantity of ground of the reſpective grains without the reſpective inconveniencies.

Between waſhing and ſhearing-time ſheep ought not to be folded, becauſe of dirtying their wool, nor from the cutting of the lambs till a fortnight after, nor in ſheep-leaſes or arable in very wet weather, for it will tread the graſs into dung.

Of folding in froſty weather.

§. 75. A ſervant of mine, a man of very good underſtanding, tells me, he has been many years a ſhepherd, but could never obſerve that the fold ever did any good in froſty weather: particularly he remembers a very ſharp froſty winter, in which a whole flock uſed daily to gather to a hay-reek, in a ground where they were foddered, yet he could not obſerve there was any better corn there than elſewhere.—I aſked him the reaſon of it; he ſaid, the froſt waſted and preyed on the dung; and I the rather approve this obſervation of his, becauſe of the great prejudice ſtrong beer and ſpirits receive by being frozen, even ſo as to become mere caput mortuums.

If froſt has the ſame effect on dung, by impoveriſhing it, that it is ſaid to have on the ſheep-fold, and on ſtrong beer: quære, whether it be proper or not, to leave horſe or cow-dung ſpread on land without ploughing it in.

Mr. Raymond is alſo of opinion, that the winter-froſts do very much deaden the folding of the ſheep, and rob it of it's virtue.

What land to fold firſt.

§. 76 Farmer Elton ſaid, the method he beſt approved of in folding, was always to fold that land firſt that was firſt deſigned to be ploughed, ſuch as white or whitiſh land, they not being apt to bear weeds, nor will the fold be apt to cauſe weeds to come, and ſuch land he would ſow firſt, viz. at St. James's-tide.——I ſaid, I ſhould think, though ſuch land ſhould be ſowed ever ſo wet, yet, if the month of Auguſt ſhould prove dry and ſcorching, it would burn, and ſuffer by ſuch early ſowing.—He replied, if ſowed wet, yet ſo as it came up, he never knew the drought to hurt it.

Of folding on barley in a dry ſeaſon.

§. 77. It was a very dry ſeaſon from the firſt of March to the ſixth of May (anno 1701) during which time I ſet my fold on my barley.—Several of the farmers in my neighbourhood ſaid, it would be apt to do the barley more harm than good, for the ſheep would ſcratch up the ſeed; whereas if rain had come, ſo that the ground had not been in a duſt, their ſcratching would have done no harm.—But I rolled before I ſet my fold, and ſo I preſume the ground was ſo faſt as to receive the leſs damage, it being alſo ſtony, and therefore the ſheep could not ſcratch it ſo much as otherwiſe perhaps they might have done: the event was, the fold did no harm, but good.

Of folding about Saliſbery and Holt in Wilts.

§. 78. Mr. Gilbert of Madington was telling me, the way of huſbandry about him, near Saliſbury, was, to fold on their wheat after it was ſowed till St. Luke's-tide, which is in the middle of October; then to draw off their flock for a month to fold their ſheep-leaſes, and then on the barley-fallows.—I aſked ſome North-Wiltſhire farmers, if about them they ever folded on the wheat-land after it was ſowed; they ſaid, no, they never knew it to be done in any part thereabouts, yet folding after the corn was ſown did it more good than before; but the reaſon why they did not do it about Holt, &c. they believed was, becauſe they were forced to lay up the wheat-lands in high ridges by reaſon of the deepneſs of the earth, and it's wetneſs, and the ſheep if folded on ſuch land, would do nothing but lie between the furrows, which would do the land but little ſervice: beſides, they ſaid, in the hill-country the land was rather of the lighteſt, and the treading of the ſheep, after it was ſowed, preſſed it cloſer than it was before, and ſo did it ſervice.

Of folding on clay and white land.

§. 79. Mr. Raymond aſſured me, that ſheep folded on ſandy lands would thereby be ſenſibly more impoveriſhed than thoſe folded on clay-lands, and this, ſaid he, the ſhepherds agree to, who live where there are ſuch different ſorts of land.—The reaſon ſeems to be, becauſe the ſandy lands draw forth and drink up the outward moiſture of the ſheep, to fill up which emptineſs of the outward veſſels, a freſh juice muſt ſucceed, and ſo on; or elſe that the ſandy lands being hot, make the ſheep perſpire more than clay-lands do, whereas the cold clay rather repels perſpiration.

If ſandy or light ground, as has been before hinted, draws the fat and moiſture of the ſheep-fold off, ſo as to impoveriſh a flock more than if they had been folded on cold clay-lands, it muſt be allowed on the other hand, that light ground may be better enriched by a fold than heavy land, becauſe the light ground imbibes more of the moiſture and fat of the flock; and this gives ſome account why it is ſaid, poor lands often pay better for their folding than ſtrong lands: for the ſame reaſon winter-folding, when the ground is wet and cold, holds no proportion to ſummer-folding.

Of folding on fallows in winter.

§. 80. Diſcourſing with farmer Biggs on huſbandry, he ſaid, he folded on the fallows all winter long, though never ſo wet; yet, ſaid he again, ſometimes the fold does harm: let it be never ſo wet, ſaid he, early in the year, folding on the fallows does no harm; for, in the firſt place, there is heat enough in the ground at the firſt hand of the year to keep off the chill, and then the ground is not ſo ſettled, but that the rain ſoon runs through it, but at the latter end of the year the ground is ſettled; then treading it with the fold in wet weather makes it hold water, by which it may be chilled, and kneads the very wet into it, whereby there will be the leſs corn.

Of folding on barley.

§. 81. Before I came from Crux-Eaſton in February (anno 1698) in order to go into the Iſle of Wight, I had a diſcourſe with an old experienced ſhepherd about folding the flock on fallows: he ſaid, as to wheat, it was excellent good, but they rarely folded on barley-land after it was ſowed, for if it was a whitiſh land, and a hot ſummer came, it would be burnt up: beſides, the ſheep would be ſcraping at that time of the year on the barley-land, and would take the corn out of the ground; but the wheat, ſaid he, lay too deep for them to do ſo.——But when I came into the Iſle of Wight, farmer Collins was of a different opinion, and ſaid, he had always folded with good ſucceſs on hot dry ſandy ground after it was ſown with barley, and was earneſt with me to try it; for, ſaid he, you will quickly ſee the benefit, and though the ſheep ſhould ſcrape, you will find the barley come thickeſt there.—There is land however about Huſborne and Stoke in Hants that will burn by folding on in the ſpring, and get more harm than good, if hot weather come, it being a hungry ſharp gravel.

Of folding on the early wheat fallows.

§. 82. As it ſeems to me, the double folding on the early wheat-fallows, to be ſown on one earth, cannot occaſion the roots of the graſs ploughed-in to ſhoot up afreſh, but rather prevents it, by treading the earth down into a hard a hard plaiſter, ſo that they cannot riſe; it is true, it may bring up a freſh new graſs, which, having weak roots, will eaſily be torn up by the draggs.

Manner of feeding ſheep among the antients.

§. 83. [g] Columella, ſpeaking of feeding ſheep, ſays, there is no ſort of land, or food, but what (by the continual uſe of that only) ſheep will he tired of, unleſs you give them ſome ſalt now and then to lick, from whence they may procure a new appetite to their meat and water. [h] All the ſummer time during the hot ſeaſons they muſt be let out to feed as early as may be, while the dew is on the graſs; and when the ſun is about four hours high, they muſt be led to water and under ſhade, and again to feed towards ſun-ſet. In the dog-days the flock ſhould be ſo led as to feed with their heads towards the Weſt in the forenoon, and towards the Eaſt in the afternoon; for it is of great conſequence, ſays he, that the ſheep's heads ſhould be turned from the ſun, which would be hurtful to them. And Varro gives the ſame directions, becauſe, ſays he, the ſheep's heads are extremely ſoft.—Perhaps this may be the chief reaſon of the rams and ewes in companies turning face to face, in hot ſun-ſhiny days. During the winter and early in the ſpring they ſhould be kept in their fold, till the ſun has melted the hoar-froſt from the graſs, which would occaſion rheums in their heads, and would alſo ſcour them: for this reaſon in the cold wet ſeaſons of the year they ſhould be watered but once a day. [i] They let their ewes, as Varro aſſures us, go out to feed with the reſt of the flock, but kept back the lambs, which were ſuckled by the ewes at their return, and then again ſeparated from them. [k] They alſo tethered their lambs at ten days old, leſt they ſhould diſlocate or hurt their tender limbs by playing together.

Of FEEDING and FATTING SHEEP,

Management of ſheep at Crux-Eaſton blamed.

§. 84. When I was giving Mr. Lawrence of Dorſetſhire a deſcription of Crux-Eaſton, and the farmers management of their ſheep there: he ſaid, he knew how the farmers managed there, and that they were to blame; for they might manage their ſheep better, and have full as good there as at Upcern, if they would feed them well in the winter, and at the latter part of the year ſend them abroad for a month, as the Dorſetſhire farmers do, into the vale-lands to refreſh their own graſs, and would fold on their ſheep-ſlates: but, ſaid he, they in Hampſhire follow the plough ſo much, that they neglect their ſheep; and ſuffering their hog-ſheep to run in the woods all the winter was a fooliſh thing; for they loſt their wool by it, and it ſtunts them in their growth, by keeping them ſo poor; and it is the greater folly, as they are to come into the places of their old ewes, whereby the flock is ſpoiled: beſides, ſaid he, when they become ewes, they will always afterwards be loſing their wool in the hedges: and if they in Dorſetſhire find but one ewe in a flock apt by that means to be bare, they will ſell her off at the next Weyhill fair.

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[g] Nec tamen ulla ſunt tam blanda pabula, aut etiam paſcua, quorum gratia non exoleſcat uſu continuo, niſi pecudum faſtidio paſtor occurrerit præbito ſale, quod, velut ad pabuli condimentum, per æſtatem canalibus ligneis impoſitum, cum è paſtu redierint, oves lambunt, atque eo ſapore cupidinem bibendi paſcendique concipiunt. Colum. lib. 7. fol. 175.

[h] Dum mane novum, dum gramina canent, et ros in tenera pecori gratiſſimus herba: inde ubi quarta ſitim cœli collegerit hora, ad puteos et umbras; rurſus ad paſcua producendum ſolis ad occaſum, &c.—Et in caniculis, ante meridiem grex in occidentem ſpectans agatur, et poſt meridiem progrediatur in orientem; ſiquidem plurimum refert, ut paſcentium capita ſint obverſa ſoli, quia plerumque nocet animalibus. Hyeme et vere intra ſepta contineantur, dum dies arvis gelicidia detrahat; nam pruinoſa iis diebus herba pecudi gravedinem creat, ventremque perluit, quare et frigidis humidiſque temporibus anni ſemel tantum ei poteſtas aquæ facienda eſt.—Ita paſcere pecus oportet, ut averſo ſole agat, caput enim ovis molle maximè eſt. Varro, f. 53.

[i] Matres cum grege paſtum prodeunt, retinent agnos qui, cum reductæ ad veſperum, aluntur lacte, et rurſus diſcernuntur. Varro, fol. 54.

[k] Circiter decem dies cum præterierunt, palos affigunt, et ad eos alligant librâ, aut quâ aliâ re levi diſtantes, ne toto die curſantes inter ſe delibent teneri aliquot membrorum. Varro, fol. 54.

Mr. Biſhop of the ſame county ſaid, he always takes care to keep his ſheep up in high caſe in very cold weather, or in deep ſnow: and the better hay, and the more of it, you give your ſheep, the better will their wool and their ſoil pay for it, and over-pay too.——He ſaid, a weather would grow fat with hay ſooner than with graſs: and, if the ſnow be but moderately deep, viz. not above a foot, the ſheep will ſcrape for the graſs: but then in ſevere weather care ought to be taken to put them in a ground out of bleak winds, and where the graſs is longeſt, as having been firſt hayned.—He approved not of the Hampſhire way of ſitting up with their folds in lambing-time; for their walking up and down with the lanthorns greatly diſturbs the fold, and makes the ewes apt to be frightened, and to run away from their ſtands in the fold, by which means the lamb is either over-laid, or ſeparated from the ewe; whereas otherwiſe the ewe and the ſheep folded would keep in the ſame place.—He likewiſe ſays, the beſt thing that can be done in lambing-time is in hard weather to fling five, ſix, or ſeven truſſes of hay into the fold amongſt the ſheep, for them to trample down, to ſave the lambs from being frozen, and to keep them dry: the hay, ſays he, is of an inſignificant value to the ſervice it does to the lambs—He adds, if it be a wet ſeaſon in lambing-time, the folds ought to be made the larger: if a hard froſty time, the cloſer the better, nor need one be afraid of the lambs being over-laid, if the fold is not diſturbed.—He ſays, in lambing-time, the fold ought to be viſited in the morning, and the firſt thing to be done ought to be to walk round it, and ſee what outermoſt ewes have lambed, and then ſlip a hurdle and draw the ewe and lamb out carefully, that the ewe may go away with her lamb to graze, and keep together; for, if the flock be let out with them at the ſame time, it is the nature of the ewe to go away to graze, and amidſt the whole flock the ewe and lamb will ſoon loſe each other: then you ſhould go inward, ſtill drawing out the outermoſt ewe and lamb.

An idioſyncraſy in cattle of the ſame ſort.

§. 85. That there is an idioſyncraſy in cattle of the ſame ſort, or ſpecies, has been already hinted; to which may be added, that farmer Iſles my tenant aſſures me, that if they about Holt, i. e. in the vale, buy ſheep againſt the winter out of the hill-country, ſuch ſheep will, as uſually, expect a great deal of hay, though they have never ſo much plenty of graſs.—And probably they may in a great meaſure expect it, through their conſtitution of

juices;

juices; for otherwiſe it cannot be ſuppoſed how giving the younger ſheep hay in the hill-country, but perhaps for one year, ſhould entail a neceſſity of continuing it for the next, where the juices of the graſſes ſo much exceed thoſe of the hills.—To exemplify which, having bought ſows with pig out of the vale, for the ſake of a large breed, where they had been uſed to be fed only on whey; theſe ſows, when they were brought into my yard in the hill-country, where there was plenty of ſhattered corn, ſufficient to keep my own country hogs, which thrived well on it, grew lean, and made but a poor livelyhood; and what more ſurprized me, the pigs of theſe ſows which were littered with me, took after grazing, and, when they came to be great hogs, they would not ſtay in the ſtubble-fields to get their bellies full, but would ſoon beat out into the graſs grounds, and ſo would the breed of the breed laſt mentioned do.—Thus ſays Horace, "Fortes creantur fortibus, nec feroces aquilæ pavidas generant columbas."—And this idioſyncraſy ſeems more viſible in beaſts and men that live on the ſimpleſt food than in thoſe that live on varieties.

To provide graſs-ground to receive the ſheep occaſionally.

§. 86. It ought to be contrived in hill-country-farms, which uſually have but a few acres of meadow and paſture, and the reſt in arable, that there be a few acres of arable (according to the bigneſs of the farm) laid down on different parts of the farm, therein commodiouſly to receive the flock of ſheep after harveſt, as often as the ſtubble-grounds may be dirty; for in wet weather, if the flock ſhould go in ſuch ſtubble, they would ſpoil more than they eat.——But yet, if grounds are laid down yearly to clover-graſſes, as is uſual in the hill-country, then it is to be noted, that grounds of the ſecond year's clover are very fit to receive the flock of ſheep in ſuch wet weather; for ground of the ſecond year's clover is well ſettled and covered with graſs, nor will it be like to be trampled to dirt, it being firm, nor is it gnaſh and luſcious, as the ſtubble-clover is, and ſo is very fit for the ſheep, and will not put their mouths out of taſte for other coarſer graſſes, as the ſtubble-clover will do.—Nevertheleſs fatting-ſheep may be ſuffered to feed freely on the ſtubble-clover; for they muſt be ſupported with other graſſes, as good as that, had they not that, and ſweet paſture of natural graſs muſt be found for them when that is fed out.

Turnips apt to breed wind in ſheep.

§. 87. Having in November (anno 1707) a good crop of turnips for the winter-feeding my flock of ſheep, I had a deſire, before I entered on the doing it, to conſult a farmer's ſhepherd, who had for many years uſed his ſheep to turnips: I underſtood from him, as alſo from others, that turnip-feeding was apt to breed wind in the ſheep and gripings, for which, while they were under the diſtemper, they knew no remedy, but to cut their throats, if they were fatting: you may perceive the diſtemper by their ſtretching out their limbs, and ſpreading them: but, to prevent this evil, they agree it is neceſſary to give the ſheep ſome dry meat in the evening, though coarſe.

It is farther agreed, that an ewe-flock is not ſo ſubject to the aboveſaid diſtemper by feeding on turnips, as a weather-flock would be, the lamb in he ewe carrying off the water, that, in ſuch caſe, the ewes are overcharged with from the turnips; for the ewes, when with lamb, piſs and dung much more eaſily and plentifully than the weathers do; which is but reaſonable to believe, all creatures with young being apt to make water often, and dung, nor are they ſo able to retain it as when not ſo: and particularly phyſicians look on child-bearing women to be more ſecure from cholick, gout, &c. than when child-bearing is over, for the above-ſaid reaſon.

Sheep to be kept out of new ſtubble.

§. 88. It is a thing commonly known, that after harveſt ſheep muſt be kept out of the barley-ſtubble till the hogs have eat up the ſcattered barley, leſt by ſwelling in the maws of the ſheep it ſhould kill them.—But I alſo find by my ſhepherd and others, that ſheep ought to be kept out of all ſorts of ſtubble till the corn is well eaten up by the hogs; becauſe the wheat and oats they leaſe will be apt to make the ſheep ſcour, as this year (anno 1719) wheat made many of my ſheep ſcour.

Tills good for ewes.

§. 89. Tills are excellent good for ewes, to breed milk for their lambs, being given them inſtead of hay, and is the true uſe of that grain: they will grow very well in ſtrong clay-land, but are rather reckoned an impoveriſher than an improver of the ground, contrary to what other kidded grains are.

Why broad-clover more hurtful to cows than ſheep.

§. 90. The reaſon why ſheep are in leſs danger of being hurt by broad-clover than cows are, may be, becauſe the ſheep feed only on the very fineſt and tendereſt part of it, nor can they eaſily be brought to taſte of the groſſeſt part of it: this I plainly ſaw when I fatted ſheep in the broad-clover this year (anno 1702).—It is however a luſcious food, and apt to throw ſheep into a ſcouring.

Broad-clover will not fat ſheep ſo faſt, nor ſo well, as hop-clover will do.

Of putting ſheep into woods after ſhearing.

§. 91. Farmer Elton adviſed me by all means, if the ſeaſon proved dry after my ſheep were ſheared, to put them into my woods of four or five years growth, for a week or a fortnight: he aſſured me, if it were a dry time, they would do the woods no harm; for in that caſe the rowety graſs in the woods would be ſweet, and the ſheep would not be tempted to crop the ſhoots; but in wet weather the rowet turns ſour.—This, he ſaid, would do them a great kindneſs in ſheltering their coats from burning, and their bodies from damage thereby: and at the ſhepherd's whiſtle they would all come out of the woods to folding.—It may be ſerviceable to the ſheep, but I doubt of the former part of his aſſertion, viz. that they will eat the rowet, and not crop the ſhoots. See my Obſervations on woods.

I had a few teg or hog-ſheep of my own, and at Michaelmaſs I bought in ſome more, and put them then into the meadows, the hedge-rows of which being cut the year before, put them upon browzing at that time of the year.—About the latter end of November, I put them into my young coppices, where they ſoon fell to browzing: we wondered at it, and were at a loſs for the cauſe; till my ſhepherd remembered me what we had done, having enticed them into the fault at the firſt hand of the year.

Of leaves for ſheep.

§. 92. Cato dicit, fol. 2. Autumnitate frondem populeam, ulmeam, querneamque cædito per tempus; eam condito non peraridam, pabulum ovibus.—

So that they were not the dead worthleſs leaves they collected, but they ſtripped the branches of their leaves whilſt growing, and made a kind of hay of them.

Swine's-graſs bad for ſheep.

§. 93. [1] Poligona, knot-graſs, ſwine's-graſs, or blood-wort, according to Columella, is very pernicious to ſheep, occaſioning violent diſtentions and contractions in their bellies, by which they bring up a thin, frothy, ſtinking matter.—The cure is to bleed them under the tail, cloſe to the buttocks, and alſo in the upper lip.

Sheep not to be drove to the field too early in froſty weather.

§. 94. The Maiſon ruſtique ſpeaking of ſheep, ſays, in winter, autumn, and ſpring, you ſhould keep them cloſe in the morning, and not carry them to the fields until the day has taken away the froſt from off the ground: for at theſe times the frozen graſs begets a rheum and heavineſs in their heads, and looſeneth their bellies. fol. 157. The ſame obſervation has been made by the antients, as I have noted before.

Some ſay, that, in the open moiſt weather in the winter, the ſheep have more need of hay than in the cold froſty weather, and it does them more good; for it dries up the water, the graſs then making them flue.

Of foddering ſheep in winter.

§. 95. In deep fat lands farmers may be in the right to hope for, and to endeavour to preſerve their ſheep without hay in winter, or as long as they can, becauſe their lands may be able to do it: yet, quære, in caſe they ſhould buy in ſheep to winter, which have been uſed to hay, whether ſuch ſheep will not only expect it, but will not alſo pay for it, if it be given them. But for hill-country farmers, whoſe winter-graſs cannot be ſuppoſed to maintain their flocks, I ſay, they ought to fodder in good time; otherwiſe their flocks will ſoon eat up all their graſs, and then they muſt, as they draw near to lambing-time, eat all hay, which is not ſo well as hay and graſs earlier in the winter would have been; and then the graſs would have held out.

Racks for foddering ſheep commended.

§. 96. Farmer Biggs commending racks to fodder ſheep in, ſaid, it was a very waſteful, ſlovenly way to fling the hay looſe about the fold, as ſome would do; for whatever hay the ſheep ſat down on, neither they nor any other cattle will touch after, for which reaſon no cattle care for feeding after ſheep, their dung and piſs being a great nuſance; but cows, ſaid he, had rather pick the dungy ſtraw and litter on the dung-hills, which comes from the horſes, than to have the ſweet clean ſtraw that comes out of the barn.

On my aſking ſeveral good ſhepherds, why they ſet the hay-racks open to the ſheep in each ground; they aſſured me, that, in that country, Dorſet, they had tried all ways of giving fodder to the ſheep, and did find, that to let them go to the racks when they had a mind to it, was beſt; for many ſheep liked graſs, and would thrive better on it than on hay; and others would eat hay better than graſs, and if the hay was very good, they would give as good

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[1] Eſt etiam ovibus gravis pernicies herbæ ſanguinariæ, quam ſi paſta eſt ovis, toto ventre diſtenditur, contrahiturque, & ſpumam quandam tenuem tetri odoris expuit, celeriter ſanguinem mitti oportet ſub cauda, in ea parte quæ proxima eſt clunibus, nec minus in labro ſuperiore vena ſolvenda eſt. Colum. lib. 7. fol. 178.

good milk for it; and many ſheep would eat it beſt, if you let them have their own time of eating it.

Of cribs.

A very good ſhepherd near me, approves very much of cribs for foddering ſheep in: he ſays, in wet weather they ſave littering of the fodder, and trampling it under foot:—but he ſays, ſometimes a cow or a ſheep has hung it's horns in the bow, and broke it's neck, but this rarely happens: that the gentleman whom he ſerves had only loſt one heifer by ſuch accident in twenty years time, and a ſheep or two.——Another told me, his maſter never loſt any cattle that way; but one morning, ſaid he, I came in good time, and ſaved two that were hanging.

I told my ſhepherd what ſort of racks I deſigned for my ſheep to be foddered in, which were according to the Dorſetſhire faſhion, as the ſhepherds there had adviſed me to make them; and he approved very well of it for the ſaving of hay: but, ſaid he, the cow-cribs with bow partitions are very ſerviceable on one account; for when an ewe, by reaſon of a luſty lamb, has had a hard labour, whereby the lamb is ſtunned, or much weakened, ſuch lamb will be able to get up and ſuck, by ſtrengthening itſelf with leaning againſt ſuch cribs as they lie in the fold.

What hay ſheep will eat in a hard winter.

§. 97. Farmer Biggs ſaid, that he was confident, if it was a hard winter, 300 ſheep would eat 25 if not 30 tons of hay.—Farmer Crapp ſaid, he had often given above 25 tons to that number of ſheep.

Mr. Slade of Tilſhade tells me, that they allow a ton of hay for every ſcore of ſheep they winter on their downs, and provide for the winter accordingly.

I aſked my ſhepherd, what quantity of hay would maintain a ſheep at Eaſton in a hard winter. He gave me no ready anſwer; I told him, I looked on five todd and an half to be a noble proviſion: he could not rightly fall into a conſideration of that proportion, but ſaid, if it was a hard winter a ſcore of ſheep would eat a ton of hay.—Whereupon we computed the difference of our eſtimates, and found that mine held a fourth part greater than his: however he ſaid, he thought his a great allowance.

Of providing coarſe hay early for wintering ſheep.

§. 98. Farmer Elton told me, that his father and he had loſt many a pound by not buying coarſe or under-hill hay at the firſt hand of the year for their ewes; for, when a hard winter has come, they have been forced to give them a coarſe hay at laſt, which has impoveriſhed them, and made them pitch, and in the breed made them ſpoil the whole flock.

Vetches for ſheep.

§. 99. About Tilſhade in Wiltſhire there is little hay, and the chief ſupport of the ſheep during winter is vetches: Mr. Slade aſſures me, if vetches cut greeniſh for ſheep ſhould take a month's rain at firſt, if they can at laſt be houſed dry, the ſheep will eat them ſtalks and all better than the beſt hay.

Houſing ſheep beneficial to their wool.

§. 100. I have heard, that in Spain they houſe their ſheep on nights, which I doubt not but contributes to the fineneſs of their wool.—And the warm fold, made warmer by the ſheep than of itſelf it would be, is better for the wool of the ſheep than for them to lie abroad.

What ſheep to be firſt fatted.

§. 101. In fatting ſheep, the barren ewes, and thoſe which have loſt their lambs, come firſt in order, and then old ſheep that are to be fatted with graſs.

§. 102. Sir

Whether ewes ſhould be rammed before fatting.

§. 102. Sir Ambroſe Phillipps's ſhepherd being in diſcourſe with me, I aſked him, ſuppoſing one ſhould fat ſheep, whether the caſe was not the ſame with the ewes, as with cows to be fatted; that is, whether or not the ewes might not be firſt rammed; and whether they would not then fat the kindlier for it. He replied, the caſe was not the ſame with ewes as with cows; for the ewes would take ram but at one time of the year only, ſome earlier, others later: but beſides, the ewes going but twenty weeks with lamb, they contrived they ſhould not be with lamb, becauſe they would be too forward with lamb before they could be fat.—I then aſked him, if he ever knew a ewe bring a lamb twice in the ſame year. He ſaid, never; but an ewe that had warped her lamb very early might ſometimes have another within the year, though very rarely.—He ſays, the graziers contrive their cows ſhould be bulled at ſuch a time, as that they may be fat for the market by the time they are half gone with calf, for then they tallow beſt, and their meat is a great deal the firmer for it.

Of fatting a ewe that warps.

§. 103. The farmers in the Iſle of Wight reckon an ewe that warps any time by or before the middle of February, ſo that ſhe may make early mutton, while it yields a good price, is as good as *couples.

* An ewe and lamb.

Weathers will not be fat in winter on hay only.

§. 104. It was the 25th of December (anno 1707) when I had at autumn fatted twenty weathers, which I deſigned to kill after Chriſtmaſs: at this time my ſhepherd came to me, and ſaid, he could not hold up the ſheep in their fat, unleſs I could find them ſome graſs to go with their hay: he told me they would waſte the beſt hay he could give them, and eat but little of it.—Till now I thought one might have fatted ſheep with hay alone, if it were very good: but on inquiring I have found, that ſuch ſheep as aboveſaid, muſt have a little graſs with their hay.—Therefore, if you would have fat ſheep to kill from Chriſtmaſs till ſpring, you ought to contrive to keep a reſerve of graſs for that purpoſe, or to ſow turnips in autumn for the feed of their leaves.

Of fatting lambs in the hill-country.

§. 105. Mr. Slade of Tilſhade, and Mr. Biſſy of Holt in Wilts, made me a viſit: and having often before complained to Mr. Biſſy, that I could not fat lambs at Eaſton, Mr. Biſſy ſaid, he was ſure I might fat lambs at Eaſton; only I muſt take this ſpecial care, to put the ewes and their lambs, within a fortnight after the falling of the lambs, into clover, and muſt keep them well, and not let them ſink; for both Mr. Biſſy and Mr. Slade ſaid, if once I let them ſink, there would be no raiſing them again: and Mr. Biſſy ſaid, I muſt take care not to let the clover be too high.

Of fatting lambs in the vale on broad-clover.

§. 106. I find by farmer Iſles of Holt, that they can in that country fat lambs exceeding well on broad-clover; but, ſays he, we cannot afterwards fat the ewes ſo well, for they will riſe but ſlowly in fleſh: the reaſon that he gave for it was, becauſe the lambs were fatted in the ſpring, while the broad-clover was young and ſweet; for it will hold ſweet and good till towards Midſummer, but then falls off, which is about the time the latter lambs are fatted, and then the ewes will not thrive ſo well with it as the lambs will do. He ſold his lambs fat this year, 1716, by the 20th of May, and then by Midſummer the ewes were well in fleſh, that is, half fat with the broad-clover; but then they got no farther by the broad-clover, only held their own till harveſt, when they throve apace, and ſoon got fat in the ſtubble.

The ſame farmer, having been two or three times at Crux-Eaſton, and ſeen our broad-clover, admits, that we cannot pretend to fat lambs with it near ſo well as they can at Holt; for the clover at Eaſton muſt be ſourer and bitterer than theirs at Holt, both from the coldneſs of the ground, and the coldneſs of the air: for, ſaid he, we at Holt, though we lie on a warm ſtone-braſh, cannot pretend to fat lambs in a cold ſpring as we can in a warm one, for the ſaid reaſon; and particularly this dry and cold ſpring, 1719, I obſerved, added he, when I brought my couples home from where I had wintered them, the ewes would keep walking much about the ground, and continue bleating, whereby I knew they diſliked their clover, and I ſaid, I ſhall have no good fat lambs this year, and ſo it proved.—I like not, ſaid he, when the ends of the wool on the backs of the ſheep twiſt, and ſtand ſpriggy, as they were apt to do this year.

If a lamb once pitches for want of milk, it will never recover it.

§. 107. If an ewe's milk after ſhe has lambed, dries away by reaſon of bad hay, or ſcarceneſs and poverty of graſs, ſo that the lamb pitches, it will never be recovered, and lambs ſo pinched will never fetch it forward again, ſo as to be ſo well grown or ſo fat, or ſo ſoon fit for the market as otherwiſe they would have been; in all which reſpects there will be great loſs, and this holds in ſome degree in other cattle.

Of fatting lambs in the hill-country.

§. 108. On telling Mr. Biſſy what encouragement I found for fatting lambs at Crux-Eaſton, I alſo added the difficulties I ſhould meet with in that affair.—He ſaid, if I thought my broad-clover would prove too ſour, and be apt to ſcour my lambs, I muſt ſow half broad-clover and half hop-clover ſeed mixed together; and he ſaid, that he and ſeveral others had of late (anno 1720) done ſo, and found it very effectual.——And I am apt to fancy, if a ſprinkling of rye-ſeed, it yielding a ſweet graſs, was mixed with the clovers, the variety would be grateful to the lambs, and make them fat the faſter.—But it is my opinion, that, if you reſerve the fatteſt of your arable-land clovers, the land being in good heart, ſuch clovers will be fat, juicy, ſweet, and nouriſhing; for I have obſerved, that, when ground has been ploughed out of heart, though it was in it's own nature ſtrong ground, yet the clovers it has produced have in their nature been weak, and their leaves thin and not ſappy, nor of a deep verdure, but of a pale colour, and ſpeckled on the back of the leaves as if fly-ſhitten, and conſequently has no good nouriſhment in it; nor would hogs or other cattle abide in ſuch clover any longer than they were forced to it; and the leaf of ſuch clover has to my taſte been an ungrateful bitter, whereas the fat ſappy-leaved clover has been agreeable.

§. 109. When ſheep are thriving, their wool is of a bright white colour.

A mark of a ſheep's having been fatted kindly.

§. 110. I find by Mr. Gerriſh of Broughton in Wilts, the great grazier, that the riſing up of the fat on the back of a ſheep in a bladderineſs, or ſort of froth and foam, is a very good ſign of the kindly fatneſs of that ſheep; which, ſays he, the turnip-fatted ſheep will do even in the winter time, whereas the fat of our ſheep, fed in winter on hay and good graſs, will lie cloſe and flat on their backs, and not riſe in bladders when they are fleaed.—He aſſures me, that thirty acres of very good turnips will fat four hundred weathers.

I went to Sir Ambroſe Phillipps's ſheep-pen with the ſhepherd: in handling the ſheep he ſhewed me the piece of fat by the briſket, before the ſhoulder, which is called the mouſe-piece, which I handled in many of them, it being bigger or leſs according to the degree of fatneſs the ſheep is in: the dent alſo on the rump I felt in many, which is occaſioned from the riſing pieces of fat on each ſide, where the ſheep are fat.

I aſked the ſhearers of Garenton, where a ſheep was to be handled to know whether it was fat or not; they ſaid, if a weather-ſheep, or an ewe that never had had a lamb, it was to be handled at the dug, and at the rump of the tail, for thoſe that are very fat will ſometimes be as big there as one's wriſt, and the ſame on the briſket and ſhoulders: an old ewe is to be judged of in the ſame manner, except in the firſt mentioned place.

An experienced butcher who is to draw out a number of ſheep at a certain price, will always chooſe for the fatteſt, though there are larger ſheep in the flock, and in good caſe too; becauſe the fatter the beaſt or ſheep, the more juicy will his fleſh be, and conſequently weigh the heavier, which will make it moſt profitable to the butcher.—And a beaſt fatted by graſs will weigh heavier than a beaſt fatted by hay, becauſe the fleſh will be more juicy.

Of fatted ſheep, viz. on turnips and broad clover, and of driving them to London.

§. 111. In diſcourſe with ſeveral butchers, they agreed, eſpecially if the winter proved wet, that turnip-mutton would be wateriſh, and not anſwer it's weight when killed, ſo well as other mutton, for perfect water would run out between the ſkin and the fleſh, it being withinſide: and, ſaid they, your mutton fed with broad-clover does not give that ſatisfaction that other mutton does; for the fat will be apt to look yellowiſh; yet in truth no mutton eats ſo ſweet as that, the fat whereof has a yellowiſh caſt, though people do not generally like it.—They ſaid further, that a ſheep or a lamb fatted would drive from Crux-Eaſton to London, with loſing but a very little of it's weight; this they ſaid, becauſe I told them that in driving from Holt in Wiltſhire to London, a weather of about ſeventeen ſhillings price would loſe eight pounds of fleſh; to which they replied, though cattle will not loſe much fleſh in driving fifty miles, yet if you drive them fifty more they will loſe their fleſh very conſiderably.—And, ſaid they, a ſheep barely mutton, ſuch as we buy of you, will not bear driving to London, though it may be but fifty miles, becauſe they would loſe that little fleſh they had got.—The hinder quarter of an ewe, that has had a lamb, is not profitable to us, nor acceptable, becauſe the udder will waſte, &c.—they owned, however, it was otherwiſe with a barren ewe, but, ſaid they, there are few of thoſe in this country.—If an ewe be going to ram when ſhe is killed, the mutton will eat rank.

Of the northern and ſouthern lambs, and why the Wiltſhire lambs, &c. ſell dear in a wet ſpring.

§. 112. I find by converſing with our Wiltſhire graziers, that fat lambs come not to Smithfield from the North till after Whitſuntide, and then, though they are huge lambs, in compariſon of the ſoutherly and weſtern, even as big again, yet they are very lean compared with our's of the ſoutherly counties.—I find, one reaſon, why not only lamb, but mutton and beef alſo, out of Wiltſhire and the ſoutherly countries, ſells dear in wet ſprings, is, becauſe the roads from the North, and Somerſetſhire, &c. are bad to travel on, and the cattle cannot go into thoſe deep leaſes, they being under water, or ſo trodden and poached, that, by reaſon of the cold, the graſs does not thrive for a bite for the beaſts, nor improve them till towards the middle of ſummer.

Diſeaſes in SHEEP and LAMBS.

Of young ſheep that have their gums grown over their teeth.

§. 1. MY ſhepherd was talking in June (anno 1703) of drawing out my old ewes for the market; and ſaid, in all likelihood there would be three or four of the younger ſort drawn out with them; and for the moſt part it happened ſo every year; for now and then a young ſheep, even one of two teeth, will have it's mouth hang over, that is, it's gums will be grown out ſo long as to ſhut over it's teeth; and ſuch ſheep muſt as much be diſpoſed of as broken-mouthed ſheep, for they cannot well get their living, but will always be out of caſe.

Of a ſheep ſpewing up it's graſs.

§. 2. Being at my fold, I ſaw my ſhepherd turn out a young ſheep to be ſold with the old ewes.—I aſked him why he did ſo; he ſaid, becauſe it ſpewed up it's graſs; and then he ſhewed me the outſide of it's mouth and noſe bedaubed with the green juice; ſuch ſheep, he ſaid, would never thrive.

Of lambs drowned in the ewe's belly.

§. 3. My ſhepherd ſays, that the cauſe of a lamb's being drowned in the ewe's belly, (the ewe's being under a ſcarcity of water, and having dry mow-burnt-hay) is, that by the greedineſs of the ewe's drinking when ſhe gets to water, ſhe gluts the lamb with the abundance of water ſhe drinks.—Farmer Bachelour alſo believes it is ſo, yet ſays, that he has ſeen lambs with a watery humour, as if they had a dropſy.

Of a cored ſheep.

§. 4. A ſheep which is cored, after it has been ſo a year, or thereabouts, (for which time it may very well live, if chiefly fed with hay) will have a water-bladder, as big as an egg, under it's throat, it's eyes likewiſe will be white, and ſo will it's mouth and gums.

If any ſheep in a flock core in the winter, it will be eaſily ſeen at ſhearing-time; for ſuch ſheep will be poorer than the reſt, and ſhew it that way by that time; and their wool will run into threads, that is, their wool will twiſt together at the ends, and look ſomewhat like teats: yet I have known ſhepherds ſay, that ſometimes the wool of very ſound ſheep will be apt to run together into threads, and the finer the wool the apter ſo to do.

Mr. Biſhop's ſhepherd caught a ſheep that was cored the laſt year, and ſhewed me how it might be ſeen by the eyes of the ſheep, they being in the valves and veiny parts, (and the eye-lids when turned up) milk-white; whereas the other healthy ſheep, he ſhewed me, had eyes as red as a cherry.—He told me, ſome would ſay, thinneſs of wool on the breaſt was a ſign of a core; but he had had no regard to that ſaying;—that ſheep that were ſo cored, being in a healthy country, and taking to eat hay, might live a year or two the longer for thoſe reaſons, but would never recover.—Note, this milkineſs of the eyes ſhews that ſuch ſheep are far gone; they may be cored before they have that to ſhew: theſe cored ſheep have the fluck, or plaice-worm in their livers, with which their gall is alſo full before they die: they call theſe worms [a] plaice-worms from their figure, which is like a plaice.—When they look on a ſheep's eye to ſee whether the ſheep be cored or not, their term is, they will ſee how the ſheep teſts.

Of the rot.

§. 5. Mr. Cheſtlin of Leiceſterſhire ſays, that ſheep when firſt touched with the rot will thrive mightily in fatting for ten weeks, but, if they are not diſpoſed of when they are come up to a pitch, they will in ſeven or eight days time fall away to nothing but ſkin and bone; he has often had them die in the height of their pitch in half an hour's time with twenty-ſeven pound of tallow in their bellies.

Mr. Raymond, Mr. Biſſy and I being together, Mr. Raymond ſaid, that if the ſummer did not rot the ſheep, it was generally agreed that the winter would not.—Mr. Biſſy replied, that he had often heard the ſame; and ſo they agreed, that there was no danger of the extreme wet winter this year (anno 1702) rotting the ſheep, ſeeing the foregoing ſummer had been ſo hot and dry as it had been.—I aſked Mr. Raymond, what he thought might be the reaſon of ſuch a ſaying; he ſaid, that a gloomy wet ſummer gave an undigeſted quick growth to the graſs of cold land, which occaſioned a rot among the ſheep; and the ſaid graſs was in danger of continuing on in that unwholſome way of growing all the following winter, till the month of March, and the next ſpring came to give it a check, and the ſpring brought forth a new graſs; whereas the power of the winter alone was not ſtrong enough to begin a rot.

Marſh-trefoil good for the rot.

[b] Mr. Ray ſpeaking of marſh-trefoil, ſays, Sir Tancred Robinſon commends it for dropſical caſes, and ſays, he has known ſheep, that have had the rot, drove into marſhes where this herb has grown plentifully, and cured by it.

Id. Spaniſh ſalt.

Mr. Boyle ſays, on the beginning of a rōt among ſheep, where it appeared, by the killing a ſheep or two, that the whole flock were touched, a friend of his cured the rot by giving each ſheep a handful of Spaniſh ſalt for five or ſix mornings together.

Mr. Raymond of Puck-Shipton in Wiltſhire, ſays, that, when the meadows are ſlabby and full of water, they are then ſafeſt, and leſs ſubject to bane than they are in a dry winter.

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[a] I am aſſured Dr. Nichols has lately communicated to the Royal Society ſeveral curious obſervations on the form and the nature of this animal, which will be publiſhed in the next volume of their Tranſactions.

[b] Dominus Tancredus Robinſon trifolium paludoſum in hydropicis affectibus commendat, ſeque ſæpius obſervaſſe, ait, oves tabidas in paludes hâc herb abundantes compulſas, ejus eſu reſtitutas ſanitati. Ray, fol. 1099.

Id. broom. John Earle, of Parks in Wiltſhire, ſhewed me how the ſheep had cropt and fed mightily on the broom: they will eat it heartily all the year, but eſpecially in the ſpring, when it is in bloſſom: it ſtains their teeth as black as ſoot; we caught one, that I might be an eye-witneſs of it.—He ſays, he believes it will preſerve ſheep from the rot, and he ſhewed me twenty, that he had bought five or ſix months before, which, he ſaid, were ſo rotten, that they would hardly drive home, but they were now recovered and grown fat, though the ground he had kept them in had hardly any pickings in it but what the broom afforded: he had another ground where the broom had been ſuffered to run to ſeed, and the ſheep had not been in it above three weeks, before they had eaten all the kids up.—Broom, ſays Mortimer, in his book of huſbandry, is one of the beſt preſervatives againſt the rot in ſheep: I have known ſheep, when not too far gone in the rot, cured of it, only by being put into broom lands.

In Somerſetſhire they keep no flocks of ſheep, for fear of a rot, it being a deep country; but are very glad of the opportunity of having the tails of the hill-country flocks: again, the hill-country farmers are glad to ſend their flocks thither for a month, after their corn is cut, to feed on the ſtubble-graſs, there not being there any danger of a rot.

The wood-evil. See Diſeaſes in cows and calves. §. 6. As to the wood-evil in ſheep, I find Leiceſterſhire is very ſubject to it: it is agreed that it is occaſioned in May, and about Michaelmaſs, by bleak cold eaſterly winds; it falls chiefly on the lambs: if an ewe be in good heart, ſhe will overcome it very well; but when it falls into their bowels, it is held incurable, nor could I find they had any medicine for it when in the limbs, but only time would wear it off.—One may perceive the diſtemper in them by their going lame, their necks, or ſome of their limbs will be drawn up altogether by it.

The ſtaggers. §. 7. The ſheep-land at Appleford, in the Iſle of Wight, is ſubject to the ſtaggers: the chief remedy they find is, to drive the ſheep to change of grounds often, to keep the grounds from tainting.

I obſerve lambs that die of the ſtaggers, do not die of them ſo very young, as whilſt they merely ſuck, ſuppoſe within the fortnight, but after they begin to eat graſs, and of thoſe the hopefuleſt and luſtieſt; by which I do conclude, that it is not the cold weather alone that brings the ſtaggers, for then it would fall more on the lambs of a week and a fortnight old than on others, they being moſt unable to bear it: it ariſes therefore from their feeding on the cold watery graſs in the months of March and April, which makes them abound with watery humours in their bodies, which the cold winds ſeize on and chill, and bring thoſe cramps and aches into their limbs. It is obſerved this diſeaſe is much prevented by early folding of the lambs, and with good reaſon, for thereby in the cold nights the lambs are kept warm, and alſo prevented from eating ſo much graſs as otherwiſe they would, whereby ſuch watery humours are fed.—Quære, whether our cold country may be proper for fatting of lambs till towards May, when the ſun has got a full power.

§. 8. In

The gid, or giddineſs.

§. 8. In opening the ſheep's ſkull for the giddineſs, it may be diſcovered where the bag of water lies, by the thinneſs and ſoftneſs of the ſkull, and ſo to know in what place to open it, for it will bend under one's finger.—A farmer at Upcern told me, if the bladder lay under the horn, there was no coming at it.

I am informed alſo, that the bladder under the horn or ſkull, which makes beaſts giddy, never falls upon any ſheep above the age of a hog or a thief; nor upon any bullock after two years old.

Of the ſhaking.

§. 9. Some years the ſheep will be apt to be taken with a diſeaſe they call the ſhaking; ſome farms are more ſubject to it than others: it is a weakneſs which ſeizes their hinder quarters, ſo that they cannot riſe up when they are down: I know no cure for it.

This ſhaking, as I obſerved, is incident to ſome farms, inſomuch as ſome years an hundred of a flock have died of it: neither Mr. Oxenbridge, Nat. Ryalls, nor Mr. Biſhop's ſhepherd knew of any cure for it.—But they ſaid that horſes going with ſheep are apt to cauſe it, and ſo are briery hedge-rows growing out into the ground; but that milch-kine and goats going with the ſheep were good againſt it.—Farmer Bartlet who rents 800 l. per annum of Mr. Freek, whoſe farm was ſubject to it, would pick out a ſheep preſently that had it.

Of blindneſs, and of the green ſcouring.

§. 10. Mr. Lewis of Broughton informs me, the ſheep of that ſide of Witſhire are not ſubject to the ſhaking, nor to the white ſcouring: as for the green ſcouring, either in ſheep or bullocks, he ſays, verjuice is beyond the oak-bark, and a more certain cure; a wine-glaſs full is enough for a ſheep, and a pint for a bullock.—He ſays, that about his part of Wiltſhire, the ſheep are troubled with a blindneſs; their cure is anointing their eyes with gooſe-dung.

The overflowing of the blood.

§. 11. Mr. Biſhop's ſhepherd ſays, he can preſently ſee if any of his ſheep are ſick by the dulneſs of their countenances, and their looking ſtill forwards: but he knows of nothing to give them in ſuch caſe, unleſs when they are ſick with the overflowing of the blood, which is about Michaelmaſs; it comes from high feeding, and a quick ſhoot of the graſs, and then he bleeds them either in the eye-vein or the tail-vein, and takes more or leſs blood from them, as they ſeem to be more or leſs infected.—When he bleeds them in the tail-vein, he lets it bleed till the blood ſtanches of itſelf: but when he has a mind to ſtop the eye-vein, it is only holding his thumb on it a little while.—He ſays, he approves of bleeding them in the eye-vein, but he never knew any body to do it but himſelf.

I aſked him again about his bleeding his ſheep in the eye-vein and the tail-vein for the overflowing of the blood about Michaelmaſs; for another ſhepherd had ſaid, he only knew the hog-ſheep to be ſubject to it: but the ſhepherd ſays, it is true, the hogs are moſt ſubject to it, and apt many times about Michaelmas to die of it; but yet he ſays, the ewes and weathers will ſometimes have it.

Of ſcouring. §. 12. The ſheep in this country about Crux-Eaſton are little troubled with ſcourings.——I aſked my ſhepherd how that diſtemper came; he ſaid, by a quick ſhoot of the graſs in the firſt hand of the ſpring; but it was eaſily cured; for, when they found it, they brought them to their hay again, and that ſtopped it: but he ſaid, in the vallies, and ſome places where the weed grunſel grows, the ſheep are much troubled with it.

I ſhewed an experienced farmer a lamb which ſcoured, having had no vent but what the ſhepherd cut.—He ſaid, by all means, if it can live, fat it off; for he never knew ſuch a lamb live to be a ſheep; it would always need freſh cutting and opening.

Mr. Smith, of Deadhouſe, ſays, that broad-clover is more apt to ſcour ſheep or other cattle than hop-clover is, and that they are both more apt to ſcour than natural graſs, and conſequently not ſo proper as other graſs to raiſe a beaſt or a ſheep in fat; that a beaſt, cow, or ſheep, if they ſcour but one day, will loſe more fleſh than they can get again in a fortnight; that, when ſheep or lambs ſcour, if you cut off the ends of their tails, it will ſtop the ſcouring, ſo that they will ſcour no more that ſeaſon.

Vide Diſeaſes in cows and calves, §. 9. I told Mr. Biſhop of Dorſetſhire, of the rind of the oak that lay under the bark, to cure the ſcouring of ſheep: he knew nothing of it, but ſaid, the diſtemper came from a quick growing of the graſs in the ſpring, and that they looked on it that their ſheep would not thrive in the fore hand of the year till they had had it; but that ſcouring at other times of the year was mortal, and that he knew of no cure for it; and that their ſcourings then would be of a naſty white ſort of matter.

His ſhepherd ſays, all ſheep will have the ſkenting in the ſpring; if they have it in the winter they look on it as unſeaſonable: the white ſkenting or ſcouring is very rare in ſheep; it happens oftener to the lambs, and very ſeldom are they recovered of it: he knew a lamb of their flock, he ſays, recover of it laſt year, (anno 1696) but when they do, they will afterward peel all over.

When I told Sir Ambroſe Phillipps's ſhepherd, that verjuice was good to give beaſts for the ſcouring: he ſaid, he did not think ſo well of that way, either for ſheep or cows, as to give a purge: in ſuch caſe, he ſays, he gives one groat's-worth of cream of tartar, two penny-worth of aloes, a penny-worth of fennigreek-ſeed, a penny-worth of turmerick, or a farthing or half penny-worth of long pepper in a quart of warm ale, for a cow; but of theſe ingredients, mixt together, and put into ſuch a quantity of ale, he would not give a ſheep above two ſpoonfuls.

Of the red-water. Vide red-water in cows and calves, §. 10. §. 13. One of the chief diſtempers in ſheep is the red-water, of which not one in a hundred ever recovers: it is thought to come by feeding on four graſs; if it ſeizes on a fat ſheep it will be worth nothing but the ſkin, for, if you boil the fleſh for the tallow, it will ſtink all over the houſe in a ſtrange manner: this diſtemper is apteſt to ſeize on thoſe ſheep and lambs that are beſt in proof.

I aſked a farmer in my neighbourhood, who keeps a very large flock of ſheep, and has had long experience in them, what he thought to be the occaſion of the red-water; he anſwered, a quick growing of the graſs in the ſpring, and a too quick thriving of the ſheep upon it, but he admitted it not to be curable. An old and very underſtanding ſhepherd afterwards aſſured me, that it came only on the ſheep when they were out of condition, and weak, and fell firſt on the ſpring-graſs, eſpecially if it were ſour.—He ſaid, before it is long gone they are eaſily cured by giving them the inſide rind of the bark of oak, but as for hay, when they are in that weak condition, they will not eat it.—Three or four little pieces will do, if one makes them chew and ſwallow it: he ſays, the chewing it has often ſtopped a looſeneſs with him.

I had much diſcourſe with an Iriſhman (anno 1700) who ſeemed very ſenſible in huſbandry, and talking with him about the diſeaſes in ſheep, he aſked me, if I knew any cure for the red-water; I ſaid, no, I thought it incurable.—He ſaid, in Ireland they had of late found out a remedy, which cured many though not all; it is as follows; when you find the ſheep's breath to ſtink, which will ſhew itſelf in the red-water, take two quarts of brandy, and two gallons of tanner's owze, that is, the liquor out of the tan-pit, with the lime bark, and the waſhings of the ſkins in it, and mix the brandy and this liquor together; then take a hen's egg and blow it, and take off the top of the ſhell, and fill it with the liquor, and put it into the horn; this is the quantity to be given to each ſheep, but if a ſheep be very weak, then leſſen the quantity; though the medicine be not infallible, he has cured, he ſays, many in his flock with it.

With us they uſually give the ſheep the following drench for the red-water, or rather to prevent it. If it be for a ſcore of hog-ſheep, then about this proportion, a ſpoonful of bole-armoniac, a ſpoonful of the powder of ginger, a handful of rue, a handful of red ſage, and about a quart of water to be boiled to a pint, give three ſpoonfuls to each ſheep.

Id. and of blindneſs.

Sir Ambroſe Phillipps's ſhepherd ſays, to prevent the red-water in ſheep, he always bleeds them twice a year in the tail-vein, at Michaelmaſs, and in the ſpring, and two or three times in each ſeaſon, bleeding them as he ſees occaſion, that is, as they ſeem more or leſs to riſe in proof: he takes four or five ſpoonfuls of blood at a time, from his whole flock round: he prefers bleeding in the tail to the eye-vein, both for the red-water, and the ſhaking, which his ſheep are ſubject to.—But he confeſſes, for the red-water, when it has ſeized on the ſheep, he knows no cure.—He ſays, garlick ſteeped in new milk is ſaid to be extreme good to prevent the red-water, given twice or thrice, a ſpoonful at a time.—Sir Ambroſe's ſheep, he tells me, are troubled much with blindneſs, which begins after the ſhearing-time; they have a white film over their eyes: he cures them, he ſays, with eye-water made of allum and vinegar.

Of the ſtone. §. 14. Common dog-graſs, quick-graſs, or couch-graſs, [c] Mr. Ray ſays, is a cure for ſheep and black cattle when they are afflicted with the ſtone, which they are apt to be in the winter and ſpring. He quotes Fran. de la Boe, and Gliſſon for his authority; but I muſt enquire farther of this, for neither the Rei rusticæ ſcriptores, nor Worlidge, nor Markham, do obſerve in oxen or ſheep ſuch a diſtemper as the ſtone.—My ſhepherd ſays, he has known a white round ſtone in the neck of a ſheep's bladder, of which it died.

Of blindneſs. §. 15. My ſhepherd came to me in July (anno 1701) and told me, I muſt get better graſs for my ſheep, for a great many of the lambs were blind or growing to be ſo: he ſaid, a ſcum grew over their eyes, which, as he had obſerved, uſually happened at this time of the year, in caſe they pitched, or ſunk in fleſh by ſhort commons; and that my weather-lambs were moſt ſubject to it.—I told him that might be becauſe they were but lately cut, ſo they muſt be ſubject to ſink on that account.—He ſaid, that might be ſomething, but when the grief of that was over, it was the ſame as before; but ewe-lambs, and ewe-hog-lambs, and ewe-hog-ſheep, and old ewes, were hardier than the weather-ſort, and would bear the winter better.—I aſked him, if there was not ſome other cauſe of their growing blind, for I had heard of others; he ſaid, yes, he knew of one more, and that was all; in wet and growing years, when the ſheep fared ſo well that they could not keep the bennets down, they would be apt to get into their eyes, and blind them for ſome time.—Note, if the ewes be the ſtronger and hardier conſtitutioned creatures than the weather-kind, this gives ſome account why the ewe-fold ſhould be better than the weather-fold, that is, manure the land better.

Sheep's eyes will often run with water, and be blind by feeding too much in the wheat-ſtubble: the cauſe is, the wheat-ſtubble runs into their eyes.—This I have heard ſhepherds ſay before, and my ſhepherd aſſures me it is true.

Sir Ambroſe Phillipps's ſhepherd agrees that gooſe-dung is good for blindneſs in ſheep.

* Cuttle-bone. In the Iſle of Harries, the natives pulverize the * ſepiæ, which is found on the ſand in great quantities, with which they take off the film on the eyes of ſheep. Martin of the Weſtern Iſles, fol. 38.

A quantity of wild ſage being chewed between one's teeth, and put into the ears of cows or ſheep that are blind, they are thereby cured, and their ſight perfectly reſtored; of which there are many freſh inſtances, both in Skie, and Harries iſlands by perſons of great integrity. Martin, fo. 181.--Wild ſage choped ſmall, and given to horſes with their oats, kills worms. ib. 182.

The loore. Vid. the loore in cows and calves, &c. §. 19. §. 16. The ſheep near Loughborough are mightily troubled with the loore or ſoreneſs of the claws, and ſo are the cows; ſometimes an hundred ſheep in a flock ſhall be down together, and ſo troubled with it that they will be forced to feed on their knees; and many times the cows, for want of good management, never recover it, but continue always lame, and grow club-footed: verdigreaſe and hog's-lard is a good medicine for it; and ſome uſe aqua-fortis for it.

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[c] Oves & boves calculis vexati in hyeme & verno tempore liberantur a recenti gramine canino. Ex Obſerv. Fran. de la Boe, p. 300.—— Idem jampridem obſervavit dominus Gliſſonius. Ray, lib. 2. fol. 1255.

For the fowle or loore in cattle, the beſt method is to take two penny-worth of allum, two penny-worth of arſenic, one pint of wine-vinegar, and two quarts of ſpring-water; boil the water till it is half gone, then pound the powders ſmall, and boil all together.—This diſtemper breaks out between the claws of a beaſt or a ſheep, with rottenneſs and ſtink: before you dreſs the ſore, you muſt pare the claw ſo far as it is hollow, then put ſo much of the liquor as will run all over the ſore; the foot muſt be dry when it is dreſſed, and kept ſo an hour: in once or twice dreſſing you need not doubt of a cure.

§. 17. I ſaw Sir Ambroſe Phillipps's ſhepherd dreſs the ſcabs in his ſheep, and he ſhewed me how to know where the ſcab was not killed after dreſſing; for where the ſcab was alive, there in the dreſſing and rubbing it would itch, which would make the ſheep mump and nibble with their lips: he ſaid, it was not good to let the ſheep-water be too ſtrong, it was better to have it of a moderate ſtrength, and to dreſs the ſame ſheep twice, than to think to kill the ſcab at once, eſpecially if the ſheep be pretty far gone with it; for it will make them grievous ſore: the ſheep, he ſaid, had the ſcab very much when he came firſt to Sir Ambroſe's, and he thought to cure them the ſooner by making the water ſtrong, but he harmed them by it; for it made ſome of them ſo ſore, that for three days and nights together they would lie down, and only feed round about them without riſing. His ſheep-water is made of tobacco, and the liquor of ſalt-beef, and ſometimes he puts ſoap-ſuds to it. The ſcab.

I told a Leiceſterſhire farmer, I obſerved two or three of his ſheep to break out, and grow ſcabby on the back.—He ſaid, it was true; but he dared not to meddle with them then, it being in January (anno 1698) becauſe they were big with lamb, for fear of ſquatting their lambs.

An old ſhepherd of Derbyſhire told me in September 1697, there was lately diſcovered a better medicine for the ſcab in ſheep, than tobacco, and ſalt, and the murrain-berry root, viz. [d] a quart of ſpring-water with about half an ounce of quick-ſilver in it, boiled to a pint; and once anointing of the ſcab with it would cure it.

The gundy or foulneſs of the tail, ſhoulder, or breaſt in a ſheep, is a ſort of itch that comes with over-heating by over-driving, or double folding them, and to rams, by heating themſelves with the ewes: it is cured by dreſſing with ſheep-water, made of tobacco, ſalt, and murrain-berry root, boiled in human urine, or water three or four hours: half a peck of ſalt, and three pounds of tobacco, and a hatfull of roots to a barrel of water or urine.—If it runs on after Michaelmaſs, when wet weather comes, it is hardly to be cured all the year, nor is it to be waſhed in wet weather.—The good quality of a ſhepherd is, to diſcover this diſtemper ere the wool be broke by it.

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[d] A gentleman of Hertfordſhire communicated to me the following remedy for the ſcab, which, he ſays, has been uſed with good ſucceſs in that country. An ounce of white mercury, and two ounces of ſtone-vitriol; diſſolve theſe in three quarts of water boiled in a glazed earthen pot, and waſh the part affected with this liquor.

Mr. Biſhop's ſhepherd ſays, when the gundy or ſcab in ſheep firſt appears, it is a boyl no bigger than the top of one's finger, and may be diſcovered in a ſheep by it's ſtanding ſtill, and wriggling, as if feeling after the itch.

When my ſhepherd uſes the ſheep-water to kill the ſcab, he ſhears off the looſe wool they have raiſed with rubbing, by clipping it as ſhort as the other wool, that by the breaking of it again, he may know whether the ſcab be cured or not.

He ſays, nothing will ſooner give ſheep the ſcab, or breaking out, than hunting them on nights, and heating them before they are folded; whereas, on the other hand, before the ewes are half gone with lamb, or when they are not with lamb, nothing is better, when they are turned out of the fold in the morning, than to drive them a little; it will ſet them which have any ſtoppage on coughing, whereby they will force the phlegm through their noſtrils.

The maggot. §. 18. Sir Ambroſe Phillipps's ſhepherd, for the maggot, lays the juice of elder, and the juice of arſe-ſmart to the ſore.

In diſcourſing with an old ſhepherd about the maggots in ſheep, it being in July (anno 1697) he ſaid, if they fell upon the back, or woolly part of the ſheep, a good ſhepherd would be careful of the wool, and not cut it off, but take the maggot out, and rub bruiſed hemlock, or bruiſed elder upon it, and all over the body upon the wool, which would keep off the flies.—An hour after diſcourſing farmer Elton's ſhepherd, he ſaid the ſame, and farther, that, if the maggot was in the tail, he would cut it out, and rub hemlock and elder upon it, but not tar the tail.—I told him, I had ſeen the tail tarred: he ſaid, then it was by a young ſhepherd that underſtood not his buſineſs; for it would not come out, but ſpoiled the ſale of the wool.—He ſaid, the plains were little troubled with the maggot, the flies ſeldom coming there.—Afterwards diſcourſing with a third ſhepherd, he ſaid, at this time of the year, and after ſhearing-time, he uſed tar to the tails, for the maggot, but not before ſhearing-time, for, ſaid he, it would now waſh out again by the weather.

If a ſheep has the maggot, it will be ſick and pine, and creep into the hedges: the cure is ſallad-oil, or freſh butter mixed with tar, and made into an ointment.

My ſhepherd was ſaying, that an ewe-fold required more trouble and care to look after it than a weather-fold did.—I aſked him, why; he ſaid, ewes and lambs were much more ſubject to the flies and worms than weathers were; becauſe ewes could not be ſheared ſo cloſe as weathers, on account of their teats; and ewes and lambs were more ſubject to ſcour than weathers.

Of lice. §. 19. Mr. Biſhop's ſhepherd told me, that it was natural to ſome ſheep to be louſy, let them be never ſo well kept, but poverty would greatly increaſe the lice: if a ſheep was ſubject to be louſy, they uſually put ſuch away, though otherwiſe never ſuch good ſheep; for it was odds but their lambs would be ſubject to it too.

He added, it was eaſy to ſee whether ſheep were either ſcabbed, or louſy, or not; for the ſcab, when it firſt appears, pitches in one ſingle patch, from which the ſheep will rub, or bite off the wool: but when they have lice, ſheep will be raiſing and thinning their wool, by rubbing their horns on it, and biting it off in many places: the beſt thing he knows of to kill the lice, he ſays, is gooſe-greaſe; and to cure one ſheep will take a quarter of a pound.

In ſhearing-time, I obſerved many lice in the ſheep; and I was told, that, if thoſe ſheep were ſheared, ſo that the crows and magpyes could come at the lice, the ſheep would in a week's time be rid of them.

It being an extreme wet winter (anno 1707) wherein we had ſcarce any froſt; I obſerved to my ſhepherd, that the wool of my ſheep ſtared very much.—He ſaid, that was occaſioned by their ſucking their wool, by reaſon of their lice, with which this winter had filled them full; for, ſaid he, it is wet that breeds lice, and makes them increaſe, nor is it to any purpoſe to ſearch their fleeces, or to medicine them, to kill the lice, till dry weather comes, becauſe the rains will continually waſh away the medicine; whereas, when ſpring and dry weather comes, it will put a ſtop to the progreſs of the growth of the lice, and then the medicines will eaſily exert their virtue.—So that I perceive the winter months are the great breeders of lice in ſheep.

Of adders biting ſheep.

§. 20. Riding in a furzy and ferny ground of farmer Stephens's, with him and farmer Sartain, I told farmer Stephens the ground was only fit for ſheep. —He ſaid, the graſs was fit, but the ground did breed ſo many adders, that he did not care to venture ſheep there in ſummer time, for one ſummer he loſt a ſcore out of threeſcore, by the adders biting them: he ſaid, it was the udder-flank, or throat, that they uſually bit the ſheep in, and that the place would look black, but they could not recover them by any ointments.—Farmer Sartain ſaid, they had ſuch a ground by Broughton, which would do the ſame: they agreed that cow-cattle and horſes were not ſo liable to this miſchief as ſheep were, becauſe in hot weather it is the nature of ſheep to riſe up often, and then run a few yards and lie down again, as alſo to run with their noſes low to the ground: it is probable the hides of the great cattle being thicker than the hides of the ſheep, the teeth of theſe venomous creatures have ſeldom force enough to enter[p].

Of ſheep lark ſpurred.

§. 21. I had an ewe in June (anno 1701) that broke out moſt miſerably about her eyes, and had a watery running, with a ſwelling, with which ſhe was blind, and continued ſo for ſix weeks: we could not imagine what was the matter with her.—My ſhepherd ſaid, he believed ſhe was lark-ſpurred. —— I aſked, what that was; he ſaid, at this time of the year, when the larks build their neſts, if a ſheep ſhould come ſo near to a lark's neſt as to tread on it, the lark will fly out, and ſpur at the ſheep, and, if the ſpur made a ſcratch any where on the eye or noſe, it was perfect poiſon, and would rankle in ſuch manner as this ewe's eye did: this, ſaid he, is certainly true, and other ſhepherds would tell me the ſame [h].

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[p] Note,—to bath the part with ſallad oil is now a known cure for the bite of an adder.

Of HORSES.

§. 1. THE Latin writers have given us ſome few rules concerning the breeding and choice of horſes, but, the greater part of them relating to thoſe that were deſigned for the war, or the chariot-race, ſuch obſervations can afford but ſmall inſtruction to the farmer, and I might, it will be ſaid, have ſpared myſelf the trouble of tranſlating or tranſcribing them. It may however be agreeable to many of my readers to be acquainted with what little they have told us of their method of treating theſe creatures, and with what were eſteemed perfections among them; add, that ſome of theſe perfections may be required even in the draught-horſe, and perhaps the more he partakes of them it may render him the more valuable.—Columella, in his rules for breeding horſes, directs, that the ſtallion be pampered, and kept high with food; that he cover not leſs than fifteen, nor more than twenty mares in a ſeaſon (but this, ſays Palladius, muſt be regulated by judgment, according to the ſtrength of the ſtallion, who will laſt the longer in proportion as he is leſs drained:) a young ſtallion ſhould not cover above twelve or fifteen mares at fartheſt; that he be not ſuffered to cover before he is three years old (not till he be compleat four, ſays Palladius) and he will laſt very well to his twentieth year.—If the mare caſt her foal, or ſhould foal with difficulty, he preſcribes a drench of polypodium, bruiſed, and mixed with warm water; but, if ſhe brings forth eaſily, he particularly cautions us by no means to aſſiſt the birth with our hands (nor handle the young for ſome time after they are brought forth, ſays Palladius) as the leaſt touch may be an injury to the foal.

The mare ſhould not take horſe till ſhe is two years old, nor after ſhe is ten; for when paſt that age ſhe will bring a weak and unprofitable breed: in this he agrees with Varro. She ſhould not be ſuffered to breed oftener than every other year, that ſhe may keep her milk the longer to bring up her foal, which ſhould ſuck two years.—Colts ought not to be broke till they are two years old, according to Palladius (but Varro ſays, till they are turned of three; if for domeſtic uſes, ſays Columella, at two years old, if for the race, &c. not till after three.) He orders horſes to be cut in the month of March, which he alſo ſays is the proper month for covering, but Varro, ſpeaking of the latter, ſays, any time between the vernal equinox and the ſummer ſolſtice. [a] According to theſe writers, if you intend your horſe for a ſtallion, you ſhould endeavour to procure one that is full ſized, beautiful, and well proportioned. His nature and diſpoſition, even when a foal, may be ſoon diſcovered, by his livelineſs and intrepidity; by his betraying no fear at the ſight or ſound of things he is unaccuſtomed to; by his being the leader of his company, more wanton and playful than the reſt, and ſometimes making trial of his ſpeed with them, and excelling them in the race; by his leaping the ditch, paſſing the bridge, or plunging into the ſtream without heſitation: all theſe are preſages of a generous and noble ſpirit.—His make and ſhape ſhould be as follows;—his head of the ſmaller ſize, and lean, the ſkin juſt covering the bone; his ears little, picked, upright, and cloſe to his head; his eyes black and large; his noſtrils wide; his neck deep, and not over-long, with a thick dark-coloured mane flowing on the right ſide; his boſom deeply ſpreading, and very muſcular; his ſhoulders large and ſtrait; his ſides rounding inward; his back-bone broad, and, as it were, double, but at leaſt not prominent; his belly of a moderate ſize; his loins broad, and ſloping downward; his buttocks round; the muſcles of his thighs viſibly numerous and protuberant; his legs ſtrait and equal; his knees round, not big, nor turning towards each other; his foot neat and firm, hollow hoofed, and not low heeled, with a ſmall coronet on the top of it; his tail long, full, and wavy; his whole body large and compact; his height proportioned to his ſtrength; of ſo manageable a temper, as to ſtart forth at once on the leaſt encouragement, and be ſtopped without much difficulty when at full ſpeed.—Great regard muſt be had to the race he comes of.—Palladius has added alſo a liſt of the colours they moſt approved; but we chooſe, ſays he, a ſtallion of one true colour, and reject the reſt, except a multitude of other perfections atone for this defect. [b] I have only one obſer-

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[h] See the author's Obſervations on wool.

[a] Equos ad admiſſuram quos velis habere, legere oportet amplo corpore, formoſos, nullâ parte corporis inter ſe non congruenti. Varro.—Cùm vero natus eſt pullus, confeſtim licet indolem æſtimare,

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mare, ſi hilaris, ſi intrepidus, ſi neque conſpectu, novæque rei auditu terretur, ſi ante gregem procurrit, ſi laſciviâ & alacritate, interdum & curſu certans æquales exſuperat; ſi foſſam ſine cunctatione tranſiliit, pontem flumenque tranſcendit: hæc erunt honeſti animi documenta.—In formâ hoc ſequemur; ut ſit exiguum caput & ſiccum, pelle propemodum ſolis oſſibus adhærente, Palladius;—brevibus auriculis, argutis, arrectis, applicatis; Var. Columella, Pallad.—nigris oculis, Col. & magnis, Pal. naribus apertis; cervice latâ nec longâ; denſâ jubâ, (& fuſcâ, Var.) & per dextram partem profusâ, (latè patenti, Pal.) & muſculorum toris numeroſo pectore; grandibus armis & rectis; lateribus inflexis; ſpinâ duplici, (ſin minus non extanti; ventre modico, Var.) latis lumbis & ſubſidentibus, (deorſum verſum preſſis, Var.) rotundis clunibus; feminibus toroſis ac numeroſis, Col. cruribus rectis & æqualibus; genibus rotundis, ne magnis, nec introrſus ſpectantibus, Var. pede ſicco & ſolido, & cornu concavo altius calceato, Pal. cui corona mediocris ſuperpoſita ſit; caudâ longâ & ſetosâ criſpâque, Col. vaſtum corpus & ſolidum; robori conveniens altitudo; mores, ut vel ex ſummâ quiete facilè concitetur, vel ex incitatâ feſtinatione non difficilè teneatur. Pal. de ſtirpe magni intereſt quâ ſit, Var.

[b] [1] Primus & ire viam, [2] & fluvios tentare minaces
Audet, [3] & ignoto ſeſe committere ponti;
[4] Nec vanos horret ſtrepitus.—Illi ardua cervix,
[5] Argutumque caput, [6] brevis alvus, [7] obeſaque terga;
[8] Luxuriatque toris animoſum pectus.
[9] Denſa juba, [10] & dextro jactata recumbit in armo:
[11] At duplex agitur per lumbos ſpina.— VIRGIL. Georg. lib. 3.

obſervation to add before I cloſe this ſection, which is, that the characters of a fine horſe given us by Virgil and Columella are in ſo many particulars the ſame, that the latter undoubtedly copied from the former.

§. 2. The tenth commandment forbids us, to covet our neighbour's ox or his aſs: it is probable the horſe is not mentioned, becauſe there were but few horſes among the Iſraelites till Solomon's time.—So alſo, Exod. xiii. ver. 8. it is appointed for every firſtling of an aſs to be redeemed; Bp. Patrick ſays, there was the ſame reaſon for horſes and camels, but an aſs is mentioned, becauſe there were plenty of them, though but few of the others.

Of buying colts for the plough.

§. 3. Mr. Clerk of Leiceſterſhire aſſures me, that if I buy colts of two years old, I may begin to work them gently in the plough, and at harrowing-time: and that, if I laid out twelve pounds, which he would adviſe me to do, rather than but ten pounds on a colt, by the time he came three years old, he would very well earn his meat.—This, he ſaid, was the practice of all Northamptonſhire, viz. to buy their colts at that age, and by the time they came four, to ſell them off for the coach.—He aſſured me, they would be preſently gentle, by being wrought two or three times with other horſes; and that their food ſhould be oats in the ſtraw, and barley in the ſtraw.

He ſays, that colts of two years old will very well do two, or three days work in the week at the plough, and at harrowing; but in Leiceſterſhire they do not plough ſo hard as with us in Hampſhire.

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[1] Ante gregem procurrit, [2] pontem [3] flumenque tranſcendit, [4] neque conſpectu novæque rei auditu terretur.—[5] Exiguum caput, [6] ſubſtrictus venter, [7] lati lumbi, [8] muſculorum toris numeroſum pectus, [9] denſa juba, [10] & per dextram partem profuſa, [11] ſpina duplex. Columella.

[1] The firſt to lead the way, [2] to tempt the flood,
[3] To paſs the bridge unknown.———
[4] Dauntleſs at empty noiſes; lofty-neck'd,
[5] Sharp-headed, [6] barrel-bellied, [7] broadly-back'd;
[8] Brawny his cheſt, and deep.
[9] On his right ſhoulder his [10] thick mane reclin'd
Ruffles at ſpeed, and dances in the wind.
[11] His chine is double. Mr. Dryden's Tranſlation of the third Geor.

The above characters given us by Varro, Columella, Palladius, and Virgil, according to our author's remark, ſeem principally to relate to thoſe horſes that were deſigned either for the manage or the chariot-race; obſerving however that theſe characters are not ſufficiently diſtinguiſhed, but too much blended with each other, he has taken from all of them together what he thought made a proper and uniform portrait of a fine horſe, in which, it appears to me, he has an eye to the war-horſe only.—The like want of preciſeneſs in diſtinguiſhing one kind from another, was perhaps a fault not uncommon among the antient writers on huſbandry, and may particularly be ſeen in Varro, who, under the article —de Bubus & Vaccis—has given us a deſcription that, taken in the whole, is ſuitable to neither ox, bull, nor cow, but has ſomewhat that relates ſeparately to every one of them, at leaſt in the judgment of our preſent graziers, and dairy-men. I know no one that has diſtinctly characterized the various ſorts of horſes, excepting it be our countryman Mr. Dodſley, who, in his Poem on agriculture, having firſt ſpoken of thoſe that are proper for the draught, and the road, has ſo well deſcribed the hunter, and the war-horſe, that, if Mr. Liſle's book were not intended merely for inſtruction, I ſhould have been tempted to have inſerted ſome lines of it in this note, for the reader's entertainment; I take the occaſion however of recommending it to him, as, I think, it has been leſs taken notice of than it deſerves, and as I wiſh the author may find encouragement to purſue his plan, and oblige the public with the two remaining books he at firſt propoſed.

Of keeping mares for breed.

§. 4. Being at Appleford in the Iſle of Wight (anno 1711) farmer Farthing was ſpeaking of his mares, that he choſe rather, for ſake of breed, to keep them than geldings, and that he had a ſtallion for that purpoſe, which went in his team.—I aſked him, how he could manage that matter ſo as to keep his ſtone-horſe quiet, and free from unluckineſs, and within incloſures; he ſaid, he kept no geldings; for whenever a gelding came into the field or the ſtable with the mares, the ſtone-horſe would immediately be biting the mares, and kicking the geldings, but would go as gentle as poſſible with the mares by themſelves: then, ſaid he, that he may not break over hedges, we always fetter him with a mare, and ſo he will be eaſy.—I replied, if he went with the mares, he would be apt to ſpoil the mare he went with, by leaping the other mares, which would endanger the putting out the ſhoulder of the mare with which he was fettered.—He ſaid, he made the links ſo long that there was no danger of that; for the ſtallion often leaped other mares in the field, whilſt he was fettered to a mare, without any inconveniency.

It is profitable to keep mares for foaling: the only inconveniency in them is, that their foals muſt come in March or April, or be worth but little; and then ſuch mares can do but little ſervice in barley-ſeed-time: but afterwards you may work them as much as the other horſes.

Of keeping colts in woods.

§. 5. I bought colts of two and three years old, and put them into the woods, from whence they broke out and ſtrayed: the farmer ſaid, I ſhould have kept them in the meadows till they had been acquainted, before I had turned them into the woods.—I replied, it being then the beginning of December (anno 1700) that the meadows would have made them ſo ſweet-mouthed, they would not have endured the woods.—The farmer ſaid, the meadows at that time of the year would not make them fine-mouthed, but he granted the hop-clover grounds would.

Of keeping mares for breed: and of colts.

§. 6. I was ſaying to farmer Parſons of Northamptonſhire, that I intended to keep mares, and to breed: this was anno 1701.—He cautioned me not to do as many did, viz. keep up the foals from the mares, and only let them ſuck morning and night, before the mares go to, and when they come from work: this will ſpoil both the mare and the foal; for the mare will fret, and her milk being pent up will over-heat, and that will ſurfeit her foal: whereas a mare ſhould do very little work, but go with her foal at graſs, till the foal is fit to go after the mare, and then it is beſt for the foal to follow the mare at work, and to ſuck a little at times. [c] Columella in part lays down the ſame rule.

Of keeping colts.

§. 7. If your grounds are bounded with good hedges and ditches, it may be convenient to keep a few colts to eat up the offal hay, the waſte and offal of the ſheep.

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[c] Columella ſpeaking of ſucking colts, ſays, cum firmior erit, in eâdem paſcuâ, in quibus mater eſt, dimittendus, ne deſiderio partûs ſui laboret equa; nam id præcipuè genus pecudis amore natorum, niſi fiat poteſtas, noxam trahit.—Therefore it ſeems farmers allow the ſucking colts to follow the the mares by their ſides in carting.

§. 8. It

Profit from horſe-dung, &c.

§. 8. It would be no paradox to aſſert, that, whereas a brace of ſaddle-geldings at London, cannot be kept for leſs than 50l. per annnm, yet the ſame geldings, in the country, may, by a gentleman, who keeps lands in his own hands, be kept in a manner for nothing: or in other words, every horſe in the country is worthy of his meat. Two geldings will give twenty-four load of dung in the year, which will nobly dung an acre of ground; this acre, modeſtly ſpeaking, will bring four crops, equivalent to four quarters of oats per acre per annum, and a new acre is to be dunged yearly, ſo there will ſoon be the produce of four acres yearly, to be accounted for in the ſame proportion, for the maintenance of theſe two horſes; and will alſo pay for the rent of the ground, ſeed, and ploughing, for three buſhels per week will maintain them. And the like computation for the yearly produce of four acres of clover, enriched by the manure, ſhall nobly maintain your two horſes in hay and graſs.—In the ſame manner may the bread-corn for a family be provided for almoſt nothing: for, in my family, that ſpends a buſhel and an half of wheat in a day, and burns ten chaldron of coals per annum, beſides wood, I have from thence at leaſt twelve dung-pot loads of aſhes in the year; and from garbage and duſt, and waſhing of the kitchen, brew-houſe, and milk-houſe, at leaſt twelve loads more, which is yearly noble manure for one acre, each of which acres will, modeſtly computed, produce equivalent, for four years, to ſixteen buſhels of wheat per acre, and four times ſixteen is ſixty-four buſhels.—Your grains alſo, and your pot-liquor devoured by the pigs, produce ſome loads of dung, nor ought the pigeon-dung to be ſlighted.—And the ſown-graſſes in each acre holding two years, eight acres of graſs are yearly to be accounted for on the ſcore of the manure ariſing from the two horſes, and eight acres on the ſcore of the houſe-manure, in all ſixteen acres, four of which will provide hay for the two horſes, another four acres will fat forty-eight ſheep, that is, ſix ſheep per acre, twice in the year, and the other eight acres wlll fat twelve cows for the houſe.

Of paſture for cart horſes.

§. 9. In our cold hill-country we ought always to have a conſideration to the paſture-grounds we reſerve for our cart-horſes in ſummer, ſo as to be able at leaſt to allot paſturage for them under good ſhelter, in cold, windy, or rainy nights; for warmth at ſuch times is of as much regard as their food.

Of barley for ſtone-horſes.

§. 10. Speaking of the great expence of keeping ſtone-horſes in the houſe, my bailiff aſſured me, that ſtone-horſes kept in the houſe in barley-ſeed-time would not be kept up in fleſh by oats, without peas or barley.—I replied, that I thought barley might give them the fret.—He ſaid, if it did heat them, as it would be apt to do, the carters would, unknown to their maſters, clap barley in an old ſack into the pond for a night, and take it out early in the morning, and would give them of this half malted, and it would cool them again: he ſaid, in ſeed-time, when the carters would be giving them barley, it would, as I ſaid, heat them, and, when they had been heated, one might perceive it, by their gnawing and eating the earth when they could come at it.

§. 11. I

A lean horſe hard worked cannot thrive by corn.

§. 11. I have heard many carters ſay, that when a horſe is out of condition, and hard-worked, no quantity of oats will make him thrive; for his work will lie ſo hard upon him, being out of caſe, that it will keep him low, give him what meat you will: but a horſe in caſe may eaſily be kept up with leſs meat, notwithſtanding he is worked.

Peas-halm for horſes in Wiltſhire

§. 12. Farmer Iſles of Holt, Wilts, aſſures me, that peas-ſtraw, or peas-halm, if well houſed, is the beſt and heartieſt fodder for cart-horſes, beyond barley ſtraw, or middling hay, and the horſes will eat it better, nor does it ſcour them, nor give them the fret.—I was ſurprized at this account, becauſe in our hill-country we ſeldom give peas-halm to horſes, nor do the cow-cattle much care for it, for they will but pick on it a little; which makes me ſuſpect, that, as in other caſes, ſo in this, the peas-halm in our cold hill country is not ſo ſweet as in the vale, but of a ſour juice, and the cattle will pick but little of it, be it never ſo well houſed.—William Sartain ſays the ſame, but adds, it will be apt to make horſes, if they be held to it, piſs high-coloured water.

In Leiceſter-ſhire.

I find the uſual method in Leiceſterſhire is to give their horſes peas-ſtraw, and they care not how little barley or oat-ſtraw they give them: they think the peas-ſtraw to be more cooling, and more heartning, and leſs binding than barley-ſtraw.—They ſeldom give oats in provender, but peas or beans mixt with wheat-chaff, or barley-chaff.

In Hants.

I was telling ſome of our Hampſhire farmers, that in Leiceſterſhire they gave their horſes peas-ſtraw, and thought there was more ſtrength in it than in any ſtraw-fodder, and valued it the moſt: whereas I obſerved, they in Hampſhire made little eſteem of it, and flung it to the dung-heap.—They replied, that they looked on it too as a very hearty ſtraw, but it was likely that, when I obſerved they flung it away, the year muſt have been bad, and it had been ill houſed; but, ſaid they, the ſtraw as well as the peas, if not well * hinted and dried, are dangerous to give to a horſe, which is the reaſon we the ſeldomer give it them in this country.

* Well put up together.

Winter vetches for horſes.

§. 13. Take care to have a good ſtore of winter-vetches between the latter end of Auguſt and the beginning of November; for the old ſtraw being then gone, and the new not ready, and the graſs almoſt at an end, they will be a great ſupport to your horſes.

I obſerved in the Iſle of Wight in May (anno 1699) that, after ſeed-time, the farmers baited their horſes ſometimes with graſs; for it ſeems, the fodder by that time has but little goodneſs in it.—In our part of Hampſhire, againſt that time, the farmers uſe to lay up ſome winter-vetches and peas for their horſes, to help out with the dryneſs of the ſtraw, and to give them a bundle after watering-time, morning and evening: but peas and vetches in the ſtraw are by no means counted wholſome till after Candlemaſs, when they have ſweated in the mow; for if they be given ſooner, they often give the horſes the fret; the drier the peas and vetches are in the ſtraw it is counted the better.—They generally reſerve the greateſt part of the peas in the ſtraw till ſeed-time, and then they give them the horſes, to cool their bodies after hard working.

To have winter-vetches in reek againſt barley-ſeed-time, is as good huſbandry as to have them againſt the beginning of winter, when there is no ſtraw, and the graſs is pretty near gone; for before barley-ſeed-time the ſtraw is too dry for horſes.

Of gore-vetches.

§. 14. This year, 1704, was a mighty dry year, and conſequently gore-vetches the ſafer to be given to horſes: our carters gave our horſes of them very freely, they being very dry and good, and I had ſix acres of them: but they filled my horſes very full of blood, and one of my coach-horſes fell down dead in his harneſs; his blood being a little heated by driving, and too thick to circulate, burſt the veſſels: therefore to drive them leiſurely, if full of blood, is beſt, and, let the gore-vetches be never ſo good, give the horſes dry meat every third week.

Winter-vetches.

§. 15. I aſked Mr. Bachelour of Aſhmonſworth, how it came to paſs, that winter-vetches were not thought proper in the halm, unleſs the weather were very dry; ſeeing, if they were well hinted, as mine this year (1700) were, without taking wet, and had well ſweated, I ſaw not how a wet day could affect them; he replied, that their halm was looſe and ſpungy, and would give in damp weather, though in reek, which would be apt to give horſes the fret.

Of hay and chaff mixed.

§. 16. Farmer Knap of Burclear gave his horſes hay and chaff, but no ſtraw, and does aſſure me, that he allowed his horſes winter and ſummer but one buſhel of oats apiece per week, and one buſhel of beans per week amongſt ſix of them. In the eight winter and ſpring months he ſaved ſix buſhels of oats per week, which comes to twenty-four quarters, and at 14 s. per quarter, makes 17 l.—but then for the four quarters of beans to be diſcounted for at 20 s. per quarter, the oats ſaved will be but 13 l.—The hay the ſix horſes will eat in the eight months will be twelve loads, which cannot be valued at leſs than 18 l.—So that this way of farmer Knap's is worſe by 5 l. per annum, than the common allowanee of oats with ſtraw, only he has ſaved all his ſtraw, which cannot be worth much more than 5 l.—Therefore this way of farmer Knap's ſeems to be a proper ſort of huſbandry in the vale, where hay is plenty, and their land too good for oats; for farmers are very unwilling to buy oats, though they come cheaper than hay, but always make the product of their own farm ſerve all occaſions: thus few farmers will buy beans for their horſes at the ſame price they may ſell oats: it is alſo a good way, where, in the hill-country, a farm grows more french-graſs-hay than the farmer can get chapmen for.

Of feeding horſes with barley.

§. 17. Oats being very dry in April (anno 1707), I thought it would be cheaper to feed my horſes with barley; ſo I propoſed it to my carters: but they were all againſt it, and ſaid, the time of the year for that was over; for, if I gave them it during the ſummer, it would heat them too much; the ſeaſon for that was in the winter.—But quære why they give horſes barley in the hot countries.

Of feeding horſes with dry peas and vetches.

§. 18. In diſcourſe about feeding of plough-horſes, ſeveral farmers allowed dry peas or vetches to be very hearty and wholſome for them, provided they had ſweat well in the mow, otherwiſe very improper.—And one of them aſſerted, that four buſhels of peas, mixt with oats, would go as far as a quarter of oats.

With chaff and oats mixed.

§. 19. In Leiceſterſhire they hold it very improper to give horſes chaff and oats together; for with the chaff they will be apt to ſwallow the oats whole.

With beans and oat-hulls.

§. 20. The Loughborough carrier gives his horſes no oats, and but very little hay: he gives them, when at Loughborough, oat-hulls and beans; viz. after the proportion of a peck of beans to a buſhel of hulls: a quarter of a peck of beans to a peck of hulls he thinks enough for one horſe at a time: he ſays, with this feed, when at Loughborough, ſeven or eight horſes, from Friday-noon to Tueſday-noon will eat him up but three, or four hundred pound weight of hay, which is at moſt but ſixteen todd: his oat-hulls coſt him 2d. per buſhel: ſo then, if a plough-horſe has two baits in the day, he will eat half a peck of beans, which at 6 s. per buſhel, will come to 9d.—and the hulls a penny.

With beans and bran.

§. 21. At London the ſaid carrier gives his horſes only beans and bran; viz. a buſhel of beans to two buſhels of bran: but there he gives them hay, becauſe he muſt pay for it, whether they eat any or not.

New peas gives horſes the fret.

§. 22. In carting of peas in harveſt, horſes ſhould be kept from eating them; they are apt to give them the fret.

Id. peas-chaff.

I gave my horſes peas-chaff in October, and it gave two of them the fret the ſecond day. Note, this was too early in the year to give them peas-chaff, which, when given, ought to bethe chaff of peas well houſed.

Of cleaning chaff.

§. 23. Mr. Bayly of Wick adviſes me by all means, to prevent ſurfeiting my horſes, and breeding diſtempers in them, to ſee my chaff well cleanſed from the duſt in the barn before it is brought into my chaff-bin in the ſtable; for, when the chaff is carried foul to the bin, the carters are many times careleſs, and in haſte, ſo that they give it not proper, nor indeed any cleanſing, which is very pernicious to a horſe, and the duſt and dirt binds up his body.

What chaff beſt,—alſo what allowance for a horſe.

§. 24. Mr. Edwards ſays, barley-chaff is accounted better than wheat-chaff, the common price of which is 2 s. 6 d. per quarter, and a buſhel of oats per week to a cart-horſe with this chaff is accounted a full allowance in the height of work.—But the farmers ſay, they allow eight buſhels to ſix horſes, and it ſcarcely does.—Chaff is accounted fouler feed than oats, and ſo not ſo good for ſaddle-horſes as for cart-horſes.—Now, ſuppoſing oats at 20 s. per quarter, the above allowance comes but to 6 l. 10s. per annum for oats.—Note, the farmers ſay, barley-chaff is too hot and binding for horſes not uſed to it, and oat-chaff is little worth.

Farmer Lavington and Thomas Miles of Wiltſhire ſay, that wheat and barley-chaff mingled together are beſt for horſes.

Coming into my ſtable (and ſuſpecting I had not the beſt chaff for my money, for I bought my chaff that year of the farmer) I found, as I thought, too much oat-chaff with the barley-chaff, and was angry: but my carter anſwered me, there was not oat-chaff enough; if there were more, he ſaid, the horſes would eat it better: one part oat-chaff and two parts barley-chaff was the beſt proportion; for the barley-chaff, though the more heartning, yet was rough in the mouth, and very troubleſome and unpleaſant on that account, but the oat-chaff ſoftened it: eſpecially after watering, barley-chaff alone was very improper, but before the water waſhed it down.—Then, ſaid I, wheat-chaff mixt with the barley-chaff ſeems to me to be beſt, becauſe that is ſoft, and anſwers all the ends of oat-chaff, and is more heartning.—This he agreed to.

The ſmaller the chaff the more nouriſhing.

§. 25. Conformable to the opinion of the antients, viz. that thoſe ſorts of chaff were moſt nouriſhing which were ſmalleſt, as has been before hinted, is our practice amongſt the farmers: for, when fodder-ſtraw is dear, we cut it, finding it thereby to be moſt nouriſhing; it ſeeming, that of the ſmaller parts any thing conſiſts, it the more enables the juices of the ſtomach to digeſt it, and the juices of that thing are the eaſier extracted from it: thus we grind corn for poultry, hogs, &c. whereby we ſuppoſe it more nouriſhing than whole corn.

Of barley-chaff.

§. 26. I thought my barley-hulls this year (anno 1718) would be very good, becauſe my barley had taken no rain in harveſt, and, the ſummer having been very hot and dry, they were the pure oils of the barley, without any mixture of leaves of weeds, &c. with them.——But my threſher told me, that my hulls, for that reaſon, were never worſe; for they were ſo rough and coarſe, and ſo harſh to the horſes mouths and throats, that my carters complained of them, and ſaid, their horſes care not to eat my barley-hulls as uſual; whereas, ſaid he, in wet years, when the broad and hop-clover grow to a height in the corn, as alſo other weeds, their leaves ſoften the aſperity of the barley-hulls.

I threſhed hop-clover for ſeed (anno 1701) and ſaved the leaves, which we beat out, and gave to the horſes, and they liked them much better than chaff.

To ſave barley ſtraw and peas-halm for litter.

§. 27. It is good to ſave barley-ſtraw and peas-halm, in the ſpring after threſhing is over, for litter for horſes throughout the ſummer; to ſave wheat-ſtraw, for which there is always in the hill-country, where there are many barns, and wheat-reeks, and leſs wheat ſowed than in the vale, a greater occaſion than for barley-ſtraw, for thatching.

ASSES and MULES.

§. 1. WITHIN five days of a ſhe-aſs's foaling, ſhe ſhould be horſed again: a ſhe-aſs was horſed two ſeaſons with a jack of her own foaling, and ſhe went through both times.

§. 2. I aſked

Aſſes of great price in Spain.

§. 2. I aſked Mr. Garret, if he had not ſeen a jack-aſs ſell for 30 l.—he aſſured me, he had ſeen two in the king of Spain's ſtables at Madrid, which coſt him 60 l. each; they were fourteen hands high, but were ſtrange rough, dull looking creatures, eſpecially about the head: the king had them to get mules.

Of mules.

§. 3. He ſaid, there was one thing very remarkable, when a mare takes a ſtone-aſs, and has a mule-foal by him, ſuch a mare will ever after go through, if leaped by a ſtone-horſe, and will never bring a horſe-foal after.

The mule begot between an he-aſs and a mare is commonly livelier, and more like the nature of the mare than a mule begot between a ſtone-horſe and a ſhe-aſs. Partus ſequitur ventrem, ſays Mr. Mortimer.

Of ſlitting aſſes noſes.

§. 4. In the iſland of Malta, Ray firſt noted the. cuſtom of ſlitting up the noſtrils of aſſes, becauſe they being naturally ſtreight and ſmall, are not ſufficient to admit air enough to ſerve them, when they travel or labour hard in the hot countries: and thence he philoſophically reaſons, that the hotter the country is, the more air is neceſſary for reſpiration.

WOOD.

Of acorns, maſt, &c.

§. 1. IF your acorns, maſt, and other ſeed be to be ſowed in a place too cold for an autumnal ſemination, your ſeeds may be prepared for the vernal ſemination, by being barrelled or potted up in moiſt ſand or earth, ſtratum ſuper ſtratum, during the winter, at the expiration whereof you will find them ſprouted, and they will be apter to take then than if they had been ſown in the winter, and will not be ſo much concerned at the heat of the ſeaſon, as thoſe which are crude and unfermented would, when newly ſown in the ſpring, eſpecially in hot and looſe grounds. Evelyn's Sylva, fo. 7.

Of the elm and ſallow.

§. 2. I know it is a tradition, that the elm and ſallow have no ſeeds: but I have raiſed ſeveral of them from ſeeds. Cook, fo. 5.

Of aſh-keys, and withy, &c.

§. 3. Mr. Raymond put me very much upon ſowing aſh-keys up and down in my woods; and ſetting plants in all vacancies.—I have known great improvements made in coppices by ſowing aſh-keys.

§. 4. The withy, ſallow, ozier, and willow, may be raiſed from ſeeds, but, as they ſeldom come to be ripe in England, the other ways of raiſing them are more practicable. Mortimer, fo. 364.

Of laying aſh, oak, and elm.

§. 5. The aſh is one of the worſt trees to take root by laying; but yet it will take. Cook, c. 1. fo. 1.—The oak will grow of laying, and ſo will the elm very frequently. ib. Cook.

Thoſe ſorts of trees which will grow by cuttings, are the eaſieſt to raiſe by layings. Cook, fo. 9.

Of laying trees.

§. 6. Touching the beſt way for laying your layers of trees, obſerve, if they be trees that hold their leaf all winter, as firs, pines, holly, yews, box, bayes, laurel, ilix, &c. let them be laid about the latter end of Auguſt. ib. Cook.

But if they be ſuch as ſhed their leaves in winter, as oak, elm, lime, ſycamore, apple-trees, pear-trees, mulbery, &c. let ſuch be laid about the middle of October. See the reaſons, Cook, ib.

I know in ſmall plants the ſpring or ſummer doth very well for laying them, for they, being ſhort-lived, are the quicker in drawing roots, ib. fo. 10. The ſame rule holds for cuttings, as to the ſeaſon, ib. fo. 12.

In laying, if you will, you may twiſt the end you lay in the ground like a with, ib.——As to laying, the harder the wood is, then the young wood will take beſt, laid in the ground, but, if a ſoft wood, then elder bows will take root beſt. Cook, ſo. 11.

I think Mr. Ray ſays, that the elder ſtick will put forth roots, if it be ſet in the ground, at any place between the knots, though there be no joint: however, if Mr. Ray has not ſaid it, I am ſure it is true.

Of raiſing trees by the roots.

§. 7. In raiſing trees by the roots of a tree, let the tree be a thriving tree, neither two young nor too old; for, if it be too young, then the roots will be too ſmall for this purpoſe, if too old, it is poſſible the roots may be decaying, and then not fit for this purpoſe. Cook, fo. 13, and 14.

Of raiſing ſuckers.

§. 8. You may raiſe ſuckers from ſuch trees as may be propagated by ſuckers, by digging about the roots early in the ſpring, and finding ſuch as with a little cutting may be bent upwards; raiſe them above ground three or four inches, and in a ſhort time they will ſend forth ſuckers fit for tranſplantation: or you may ſplit ſome of the roots with wedges, or break them, covering them with freſh mould; they will quickly ſprout out. Mortimer, fo. 323.

Of the time of planting.

§. 9. Monſieur Quinteny, part 2d. fo. 180. ſaith, I affect to plant preſently after Martinmaſs, in dry and light grounds, but care not to plant till the end of February in cold and moiſt places, becauſe the trees in this laſt can do nothing all the winter, but may more likely be ſpoiled than be able to preſerve themſelves; whereas in light grounds they may begin even that very ſame autumn to ſhoot out ſome ſmall roots, which will be a great advance to them, and put them in the way of doing wonders in the following ſpring.—I recite my author, becauſe I think it applicable to planting quick-ſet hedges; having in the year 1702 planted quick-ſet hedges in November, in very good, but ſtrong cold clay-land, and the winter proved wet, whereby ſuch land muſt be ſo much the colder; but the ſummer proved a very dry hot ſummer, which one might have thought more beneficial to ſuch earth, but (according to Monſieur Quinteny's obſervation) the ground being chilled, the plants came not away all the ſummer following, making very poor ſhoots, and but juſt ſaved themſelves from dying; and I believe their condition was ſo much the worſe, becauſe I ploughed up the trench wherein the ſets were planted, before it was dug, whereby the earth laid ſome time a ſodding: on the other hand, I planted a mead of cold clay-land the latter end of February, but the land was very good; and the plants made extraordinary ſhoots.

Legendre, the Frenchman, ſays, in ſuch ſoils as are moiſt, and backward, it is beſt to ſtay till the end of February before you plant; becauſe too much moiſture corrupts and rots during winter, but the hot and early grounds muſt be planted in November, that the roots beginning before winter, whilſt the warm weather laſts, to put forth ſome ſmall filaments, may ſo unite themſelves with the earth, that the trees at ſpring may grow and flouriſh ſo much the faſter, fo. 19.—Trees are not fit to be replanted, till their ſap be wholly ſpent, for, if there be any ſap in them, when they are taken up, having now no more nouriſhment, they fade, and their bark which is yet tender, will grow rivelled and dry, and ſo it is the leſs capable of receiving the new ſap when it begins to aſcend in the ſpring, fo. 93.—We ſee that, if trees grow yellow, and ſick, having but a ſmall ſtore of ſap, they preſently caſt their leaves, ib.——Now ſeeing that the ſap falls ſooner in dry grounds than in thoſe which are moiſt, it is certain that in ſuch grounds trees may be both taken up, and alſo replanted earlier, ib.—The ſmall branches and buds of a tree new planted muſt be taken off, which open a paſſage in the bark, and come out of the body of the tree, for they always grow up with the greateſt vigour, fo. 96.—In pruning, and ſtopping the growth of the boughs, care muſt be taken to cut one ſhort one between two long ones, that being unequal when they come to ſpring, the middle of the tree may be the better furniſhed. In the ſame manner muſt the dwarf-ſtanders be cut, becauſe that each branch, which is cut, puts forth many more, and therefore being cut all of the ſame height, they cauſe confuſion of branches in the top of the tree, and the midſt of it in the mean while remains unfurniſhed, becauſe the ſap deſigns always to aſcend, and runs more willingly into the high boughs than into thoſe that are lower, fo. 124.

Lord Pembroke tells me, it was a common ſaying, that all trees were to be planted when their leaves were falling: and he looked upon it to be a good rule for ſuch trees as were naturally of the growth of the ſame country where they were tranſplanted, or of a cold country, as the northern fir, which naturally grows in the north; if any of them are tranſplanted hither, or raiſed from ſeeds, they may be tranſplanted at the firſt fall of the leaf before winter: but it is otherwiſe with the ſouthern fir, for you muſt ſtay till the warmth of the ſpring for the tranſplanting of that; and this diſtinction, ſaid he, it was reaſonable to think held good in all caſes between northern and ſouthern plants.

I obſerve fir and holly-leaves do not fall ſo often on our cold hills, as in the vale, nor do the ſpruce-fir in particular litter our walks ſo much as in warmer places: the reaſon why theſe ever-greens keep their leaves ſome years, is from the viſcidity of their juice, which is more ſo in our cold country, but in a warmer ſoil or clime is ſo attenuated, that the leaves muſt fall oftener.

Langford of planting ſays, that when the ſeedlings are grown up a foot high fit to be removed into the nurſery for inoculating, &c.—the tap or heart- The manner.

heart-root ought to be cut off, that it may not run directly downward beyond the good ſoil, but may ſpread it's roots abroad in breadth.

Strong and well-grown trees may proſper as well or better than ſmall ones, eſpecially in uncultivated or ſtiff land by nature, where young trees cannot ſo well put forth roots. And, if you ſhould have a tree between ten and thirty years old that you have a mind to remove, you muſt about November, the year before you tranſplant it, dig a trench as narrow as you pleaſe, but ſo deep as to meet with moſt of the ſpreading roots, at ſuch diſtance round about the body of the tree as you would cut the roots off at when you remove it; about half a yard diſtance from the body of the tree may do very well, except the tree be very large, but, if you have not far to carry it, leave the roots the longer; as you make the trench, cut the roots you meet with clear off, and ſmooth without ſplitting them, or bruiſing the bark; then fill up the trench again, and by the next October, when you take up the tree, you will find thoſe great roots will have put forth many fibrous roots, and made preparation for more, which freſh and tender roots upon removal will enable the tree to draw more nouriſhment than otherwiſe it would be able to do. Langford, fol. 81.

Of cutting off the tap-root.

§. 10. Before I had read Quinteny, and found by him, how neceſſary it was to ſpread the uppermoſt range of roots flat down, ſo as to run between two earths, I knew not the reaſon for cutting off the tap-root; but now it is plain the uppermoſt range of roots could not be ſo ſpread unleſs the tap-root were cut off.—There is alſo a farther reaſon for cutting off the tap-root, becauſe being a ſtronger root than the reſt, it draws the nouriſhment from them, and ſhooting downwards, after ſome time dies in the poor clay, and the other ſpreading roots being cramped and ſtunted at firſt, never after make good roots, or recover it.

Rules for planting.

§. 11. [a] Columella adviſes, to ſet trees removed towards the ſame aſpect they grew in before. lib. 5. fol. 150.

In tranſplanting omit not your placing trees towards their accuſtomed aſpect, ib. and, if you have leiſure, make the holes the autumn before.—Plant deeper in light, than in ſtrong ground, and ſhalloweſt in the clay: five inches is ſufficient for the drieſt, and two for the moiſt land, provided you eſtabliſh your plants againſt the wind. Evelyn, fol. 224.

[b] On a rocky, chalky, or gravelly ſoil, if you cannot conveniently raiſe a hillock, and plant on the ſurface, dig the holes ſhelving inward, that the roots may find their way upwards, and run between the turf and the rock.

Plant forth in warm and moiſt ſeaſons, the air ſerene, the wind weſtward;

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[a] Mr. Miller concludes this rule to be of no conſequence, from ſeveral trials he has made.

[b] Mr. Miller adviſes, if the trees have been long out of the ground, ſo that their fibres are dried, to place their roots in water eight or ten hours before they are planted; obſerving to plant them in ſuch manner, that their heads may remain erect, and their roots only immerſed therein; which will ſwell the dried veſſels of the roots, and prepare them to imbibe nouriſhment from the earth.

but never while it actually freezes or rains, nor in miſty weather, for it moulds and infects the root. Evelyn.

[c] I was diſcourſing with Lord Pembroke on his plantation of elms at Wilton, which were of the largeſt magnitude any had been known to be planted: he ſaid, of thoſe, the heads of which he had lopped when he planted them, not one in twenty lived, but of thoſe he had planted with their heads unlopped, not one in twenty died.

Trees produced from ſeeds muſt have the tap-roots abated, the walnut-tree, and ſome others excepted; and yet, if planted merely for the fruit, ſome affirm it may be adventured on with good ſucceſs: you muſt ſpare the fibrous parts of the root, thoſe who cleanſe them too much are puniſhed for their miſtake. Evelyn, fol 224.

Of planting a coppice.

§. 12. If you are to plant a coppice, it is a good way to ſet your plants in trenches, as one raiſes quickſet-hedges, and not to ſow ſeeds, for they are tedious in coming forward, and will tire one's patience in weeding them.—I would not ſet above four plants in twelve feet ſquare, and at regular diſtances, ſo that the benefit of ploughing might not be loſt, and then at ſix or ſeven years growth I would plaſh, by laying the whole ſhoot end and all under the earth in the trenches, which would not therefore be choaked, but ſhoot forth innumerable iſſues: this, by great experience, oak, aſh, hazle, and withy, will do.

In our parts we never ſet leſs than an hundred plants in a double chaſed lugg; and, if the earth turned up ſuch rubbiſh and ſtony ſtuff that the edge of earth on which they are to plant, is too narrow for a double chaſe, then they always ſet eighty plants on a ſingle chaſe in a lugg.

Of young aſhes taken from woods.

§. 13. Young aſhes taken out of the wood to be planted, will neither be well rooted nor taper, but top-heavy; therefore you will be obliged to take off the heads before you replant them; and then, at beſt, expect but a good pollard, and it is poſſible you may wait long before you can get it to thrive; for the head being taken off leaves ſuch a wound as will be long in curing, and yet you were obliged to do it, or elſe the roots could not have maintained that head: it is the ſame with a walnut, therefore be ſparing of taking off the topmoſt of them. Cook, fol. 2.

Id. and of walnuts.

If you move a little aſh-ſhoot of about one foot in ſtature, you muſt not by any means take off it's top, which being young, is pithy, nor by any means cut off the fibrous parts of the roots, only that downright or tap-root is totally to be abated: this work ought to be done in the latter end of October or the beginning of November, and not in the ſpring, Evelyn's Sylva, fol. 41. The ſide branches of ſuch a ſhoot may be cut off, ib. Being once well fixed, you may cut it cloſe to the ground, as you pleaſe, it will cauſe it to ſhoot prodigiouſly, ib.—-Never let your walnut-tree, when tranſplanted, be above four years old, and then by no means touch the head with your knife, nor cut away ſo much as the tap-root, if you can conveniently diſpoſe of it, ſince being of a pithy and hollow ſubſtance, the leaſt diminution or bruiſe will greatly endanger the killing it. Ev. ib.

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[c] Mr. Miller greatly diſapproves the modern practice of removing large trees. If planters, ſays he, inſtead of removing theſe trees, would begin by making a nurſery, and raiſing their trees from ſeeds, they would ſet out in a right method, and ſave a great expence, and much time; and they would have the conſtant pleaſure of ſeeing their trees annually advance in their growth, inſtead of their growing worſe, as will always be the caſe where old trees are removed.—For of all the plantations which I have yet ſeen, let the trees be of any ſort, there is not one which has ever ſucceeded. —— New-planted trees, ſays he, ſhould be watered with great moderation, and he proves, from an experiment made by the reverend Dr. Hales, that it is impoſſible ſuch trees can thrive, where the moiſture is too great about their roots.

Walnut, aſh, and pithy trees are ſafer pruned in ſummer than in winter, in the warm weather than in ſpring, whatever the vulgar may fancy [d]. Ev. fol. 223.

Of timber.

§. 14. The feedingeſt ground makes the tougheſt timber, for where an oak grows moſt in a year, that oak will make the tougheſt timber; but in dry grounds oaks grow ſlow, and the annual circles being cloſe together, the timber muſt then be the finer grained. Cook, fol. 37.

Growth of timber.

The inſide rings, ſays Evelyn, are more large and groſs, and diſtinct in trees, which grow to a great bulk in a ſhort time, as fir, aſh, &c. ſmaller or leſs diſtinct in thoſe that either not at all, or in a longer time grow great, as quince, holly, box, lignum vitæ, ebony; ſo that by the largeneſs and ſmallneſs of the rings the quickneſs or ſlowneſs of the growth of any tree may perhaps at certainty be eſtimated. Theſe ſpaces are manifeſtly broader on the one ſide than on the other, eſpecially the more outer, to a double proportion or more, the inner being near to an equality. It is aſſerted, that the larger parts of theſe rings are on the ſouth and ſunny ſide of the tree, which is very rational and probable; and this ſeems to be the reaſon for ſetting a tree, you remove, in the ſame poſition, becauſe of maintaining the ſame parts in as good a manner as before. Wafer, in his book of the iſthmus of Darien, ſays, the Indians know not, when the ſun is obſcured by clouds, how the points of the heavens lie, but by cutting round the bark of a tree, and on that ſide the bark is thickeſt they know to be ſouth.—It muſt be much more ſo in our northern climates than under or near the tropic.

Of the circulation of ſap.

§. 15. There is a diſpute among the learned enquirers whether there is a uniform circulation of ſap in plants, or not. [e] The author of the Burgundian philoſophy aſſures us, that, if ſome of the roots of a plant be put into water, and other roots of the ſame plant be kept out of water, yet theſe latter will increaſe, and ſhoot forth fibres as well as the former; again, if a plant, that has two branches, be taken up by the roots, and the extreme part of one of theſe branches be put in water, this whole plant ſhall remain a long time without any decay, and even ſometimes put forth leaves on the other branch, when another plant of the ſame kind, taken up in the ſame manner, and none of the roots or branches put in water, ſhall ſoon wither and die. From theſe two experiments he infers, there is a reciprocal circulation of ſap from the trunk to the roots.—We are told by Ray, fol. 128. (Malpigius and others concurring) that one of the main uſes of the leaves in trees and plants is to prepare and concoct the nouriſhment of the fruit, and the whole plant, not only that which aſcends from the root, but what they take in from without, from the dew, moiſt air, and rain. As a proof of this, it is aſſerted, that if many ſorts of trees be deſpoiled of their leaves, they will die, as it happens in mulberry trees, when the leaves are plucked off to feed ſilk-worms; and if in the ſummer ſeaſon you denude a vine branch of it's leaves, the grapes will never come to maturity, becauſe the juice returns from the leaves that ſerved to nouriſh the fruit: hence alſo they infer a circulation of the juice in plants. ——That there is a regreſs of the juice in plants from above downwards, and that this deſcendant juice is what principally nouriſhes both fruit and plant, is well proved from the experiments Mr. Brotherton has made. Phil. Tranſact. No. 187.

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[d] Mr. Miller adviſes, by no means to cut off the main leading ſhoots when you tranſplant, for, by ſeveral experiments he has made, he has ſound, that the ſhortening of the branches is a great injury to all new-planted trees.—See his Dictionary—article—Planting.

[e] Si ejuſdem plantæ quædam radices aquâ ſunt immerſæ, reliquæ extra aquam extarent, eæ tamen, ut radices intra aquam demerſæ, increſcere viſæ ſunt, & novas fibras emittere; quod demonſtrat quòd reciproca circulatio eſt à trunco in radices. Phil. Burgund. ſol. 1149. Eadem eſt ratio plantæ à terra cum radicibus avulſæ, & in duos ramos diviſæ; nam ſi unius rami extremum aquâ immerſum fuerit, planta diu integra & viridis permanet, & interdum folia in racemo altero germinat, cum alia planta ejuſdem generis tunc avulſa ſtatim marceſcat.

Mr. Bobart aſſures me, that in a nurſery, he has bent the top of a young grafted plum-tree to a plum-ſtock, and grafted it; and that, when the graft took, he cut off the young tree from the root; which tree notwithſtanding flouriſhed, and bore fruit by the retrograde ſap, which ſhews the ſap deſcends as well as aſcends[f].

Wind makes the ſap riſe.

§. 16. My woodward aſſures me, that windy weather makes the ſap riſe much ſooner in trees than it would otherwiſe do, though not attended with rain, eſpecially if the wind be ſoutherly or weſterly.

A branch that blights one year apt to blight the next, and why.

§. 17. It is very generally to be obſerved, that where a whole tree, or arm of a tree, is much blighted one year, it is very apt in ſuch caſe, to blight again in following years, eſpecially if the ſeaſon of the year ſhould not be kindly: for which this reaſon may be given; there are particular roots which for the moſt part feed particular branches, though there may be alſo a conſiderable nutriment from the general circulation of ſap; now, if any ſuch root fails, as by many cauſes it may, no wonder if the branch ſo depending on it ſhould yearly blight, and yet it may at ſpring put forth leaves, &c. by reaſon of the great redundancy of ſap, by participating of the ſuppoſed common circulation; but when the ſap grows leſs vigorous, then the failure will appear. Again, in all blights you muſt ſuppoſe a ſhrinking, and contraction of the fibres, and veſſels of the branch that blights: no wonder then, if on ſuch withering, contraction, and cloſure, they never again receive the ſap ſo kindly as before, eſpecially after the run of the ſpring-ſap is over, which may for a time produce leaves and bloſſoms, but will by Midſummer, when that plenty abates, be deſerted.

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[f] In oppoſition to the notion of the circulation of the ſap in trees, ſays Mr. Miller, the reverend Dr. Hales has preſented us with many experiments, and thinks upon the whole, from theſe experiments and obſervations, we have ſufficient ground to believe, that there is no circulation of the ſap in vegetables; notwithſtanding many ingenious perſons have been induced to think there was, from ſeveral curious obſervations and experiments, which evidently prove, that the ſap does, in ſome meaſure, recede from the top toward the lower parts of the plants; whence they were, with good probability of reaſon, induced to think, that the ſap circulated.—— Vid. theſe experiments in Miller's Dictionary, article, Sap, or in Dr. Hales's Treatiſe on vegetable ſtatics.

Not to put cattle into woods to eat up the ſedgy graſs.

§. 18. I obſerve the ſedgy graſs comes not up in felled coppices the firſt ſummer; conſequently the young ſhoots have a year's ſtart of that graſs; the next ſummer the ſedgy graſs comes up, and grows ancle-high, equal with the two-years ſhoots; but what harm can it then do the wood? the third year the ſedgy graſs dies, and you ſee no more of it. I ſpeak this, in anſwer to the country-man's objection, who pleads for putting ſome ſort of cattle into coppices to keep down the ſedge, which he pretends otherwiſe will choak and damage the plants.—I have experienced this to my coſt.

Oak-buds poiſon to cattle.

§. 19. It was May the 6th (anno 1701) that I bought ſome yearlings; and I aſked the farmer, if I might not put them in the coppice till Midſummer; the farmer ſaid, not yet, by any means; for fear they ſhould be oakered, that is, leſt they ſhould bite off the oak-bud before it came into leaf, which might bake in their maws and kill them, but after the oak-bud was in leaf it would be ſafe enough.—The higher coppices are fit for yearlings, and the coppices of the laſt year's growth for hog-ſheep in winter.—My ſhepherd ſaid, what the farmer obſerved as to the oak-bud was true; but he thought that the year was ſo backward that they were not yet come out, and ſo there could be no danger at preſent.—Farmer Elton ſaid, his father had loſt abundance of yearlings by the oak-bud, by putting them into the coppices while that was out.—I have ſince experienced the ſame, and have remarked it, when I treated of black cattle. See Grazing, §. 17.

Of calves cropping woods.

§. 20. It is a common ſaying, that calves will not crop in woods: but I put ſix calves into my woods, in November, which very much cropped the yearling-ſhoots. All huſbandmen I told of it very much wondered at it; but the reaſon to me was clear, viz. on firſt putting them in there came three or four days hard froſt, with a ſhallow ſnow, and a rime that laid on the bennetty graſs, ſo that they could not come at the ground, but could only meet with brier-leaves, of which, though I had plenty, they were but thin diet to depend on altogether, yet together with other pickings would have been a noble maintenance for them, if they could have come at the rowet: this ſtreightneſs of commons brought them to the neceſſity of cropping the young ſhoots, which they afterwards continued to do, having got the habit of it, and finding, when the open weather came, the ſhoots to be toothſome, though the rowet in the coppices would have been ſufficient.

For a general rule, newly weaned calves are leſs hurtful to newly cut ſpring-woods than any other cattle, eſpecially, if there be abundance of graſs; and ſome ſay, colts of a year will do no harm; but the calves muſt be permitted to ſtay awhile longer, and ſurely the later you admit beaſts to graze the better. Evelyn, fol. 147.

Of wood hurt by cattle.

§. 21. I was at my coppice where my labourers were felling, and obſerved to them with ſome wonder, that, though the coppice then felling was of my own preſerving, ever ſince it was laſt felled, yet the growth ſeemed not more than it was, when in the farmer's hands, who abuſed it with cattle, nor did I ſell it for more than when I laſt felled it.—The reaſon they judged, was, becauſe the biting it in the farmer's time had brought it to a ſmall ſtem, and, ſaid they, wood of a ſmall ſtem or ſtock will not bring a large ſhoot; for it requires two or three fellings to paſs, though preſerved, before wood abuſed can recover to a ſtem, ſo as to ſend forth a good ſtrong ſhoot.--Note, from hence ariſes a corollary, as a farther inducement to let coppice-wood grow to fourteen years growth, if the land will ſo long maintain it, becauſe the circle of the annual growth is not only thereby much increaſed, but alſo from a larger ſtock or trunk ſtronger ſhoots will put forth, and carry a proportionable annual increaſe to the fourteen years end.

I carried two experienced woodmen into my woods, they having bought ſome lops of me, and ſhewing them the damage the farmer had done me, they obſerved it, and ſaid, it was much to be lamented; becauſe thoſe ſhoots, which were cropped, would grow forked, and never be fit for rods.——I aſked my woodman what price my rods yielded; he ſaid, the laſt year 12d. per hundred, but this year, 1699, wood being dearer, 14d. per hundred, and, in caſe they were not bit by cattle, they would fetch 15d. or 16d. per hundred. —The above two men adviſed me to cut this coppice at ſeven or eight years growth; for, ſaid they, the roots are ſo much damaged by the feeding of cattle, that they will be apt to die away, and not maintain their burden to ten years growth.

I was ſeeing my woodman make his fold-hurdles: he was very uneaſy about the ſplitting them and working them; he ſhewed me two or three knots in moſt of the rods where they had been bit in the growing by the cattle; where the rods had been ſo browſed that they would hardly ſplit through thoſe knots, at leaſt not by an equal diviſion without ſnapping off, and many of them did ſnap off, and ſuch ſplit rods, if they would ſplit, and the whole rods, when they come to work and wind, would in twiſting often break at thoſe knots.—From all which I do conclude, that it is of a very ill conſequence to put cattle into coppices, for which the treading down the briers and ſedge is but a ſmall equivalent.—And if hog-ſheep are put in, and at ſeaſonable times, it is endleſs watching them; for when they begin to fall on the wood, they will all fall on together, and bite every ſtem in two days time: —and it may be concluded from that brittle knottineſs, which the working thoſe rods diſcover, how ill the ſap can paſs upwards, to feed the top-ſhoots, through the whole compaſs of years they have to grow, to the growth of which the obſtruction the ſedge gives for one year can be but little: admitting which, I would then adviſe the ſhepherd, at a proper time, to go with his whole flock, and tread down, and eat up ſuch rowet in one day's time, taking ſuch a time or times for it as may be moſt ſeaſonable, as ſuppoſe froſty weather, the rowet being then the ſweeteſt.

The 17th of January (anno 1702) I ordered my hog-ſheep to be turned into the coppice, intending they ſhould eat up the rowet for ſome time.—My ſhepherd immediately drove them thither, but, as he obſerved, the ſheep inſtead of eating the rowet, fell on the young ſhoots, and eat them with that greedineſs, that he called the labourer who was felling in a neighbouring coppice, to obſerve it alſo: and he told me of it afterwards, and ſaid, he ſtood by and ſaw them bite off ſhoots at half a foot in length.—The reaſon of this, ſaid he, muſt be from their ſweet feed on your clover, for which cauſe they will not, like other ſheep, touch your ſour rowet.

The reaſon why ſhoots bit off by the cattle periſh farther downwards than the ſame branch would do, if cut with a knife, is, becauſe the top of the ſhoot being bit, is rugged, whereby the water runs not off, but keeps ſoaking down; whereas, had it been cut with a tool, it's ſmooth and ſloped edge, like a hind's foot, would caſt the water off.

It is generally ſaid, that ſheep going in woods, and rubbing againſt the trees, or the young ſhoots, do by their wool poiſon the very bark, ſo that it ſhall in that place canker, or at leaſt the tree in that place ſhall viſibly grow hide-bound, and bend in, and grow gouty above ſuch rubbing-place.—This I ſuppoſe muſt ariſe from the abundance of oil in the wool, which, the ſun and wind drying it in, enters the bark, and choaks up the pores, where the paſſage of the ſap is: in the ſame manner ointments laid on ſwellings are repellers, inaſmuch as they ſtop the pores of perſpiration; and linſeed-oil laid on bricks keeps out weather.

Damage from hogs in woods.

§. 22. Farmer Rutty told me, he had once heard ſay, that hogs would do as much harm in a young coppice as any other cattle; but I did not believe it, till fetching away ſome wood he had bought of me in July (anno 1701) he found a farmer's pigs broke into my coppices, and he obſerved them to fall on the ſhoots, and eat them up as faſt as other cattle. [g] I wonder the antients, who preferred wood to paſture, ſhould not conſider the damage that cattle did them.

Of letting coppices grow to fourteen years.

§. 23. My woodward aſſures me, that if I would let my coppices run to fourteen years growth, inſtead of ten, which I might do by dividing them accordingly, they would yield a fourth part more profit, becauſe a coppice at fourteen years growth will yield double the value of a coppice at ten, the increaſe of wood when it comes to be eight or nine years old does ſo much advance.—But here it is to be noted, that there are ſome parts of my coppices which grow on very barren land, that is out of proof, and the wood will be ſcrubbed and grow rotten, and dead on the tops before it is ten years old; it cannot be profitable to let ſuch wood grow to fourteen years of age.—He alſo aſſures me, that my hazle at fourteen years age, which runs up without knots, is as fit for hurdles, being ſplit, as any other.

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[g] Paſcuntur armenta commodiſſimè in nemoribus, ubi virgulta & frons multa. Varro, fol. 56.

I was ſpeaking to my labourers of the advantages of letting my coppice-woods run to fourteen or fifteen years growth, where the land was in condition good enough to ſupport the wood to that growth.—They added to what I had ſaid, that, by letting the coppices ſtand ſo long, the wood would be run to ſo large a ſtature as to over-ſhadow the graſs, whereby the roots of the ſedge-graſs, which ſo much over-run the young coppices, to the prejudice of the young wood, would thereby in a great meaſure be killed.

Letting coppice-wood grow to ſixteen or ſeventeen years growth is of great ſervice to young heirs, becauſe by ſo many years growth their barks are caſe-hardened, and able to withſtand the cold, when the coppice is cut, and they muſt ſtand naked, whereas, when coppices are cut at ten and eleven years growth, the barks of the young heirs are ſo tender, that they are ſtarved with the cold air and winds. Ivy itſelf, ſays Evelyn (the deſtruction of many a fair tree) if very old, and taken off, does frequently kill the trees by a too ſudden expoſure to the unaccuſtomed cold.

When coppice-wood is of fourteen or fifteen years growth, it will fetch a better price in proportion than younger wood, becauſe it will be applicable to more uſes, and particularly in the cooper's buſineſs; for he will uſe the withy and ſome of the aſh for hoops for wine-hogſheads; another part of the aſh may ſerve for prong-ſtaves, rake-ſtaves, and rath-pins for waggons, and the reſt may be parcelled out for hurdle and flake-rods.

Oaken ſtems of fourteen years growth are (in my woods, which in a great meaſure conſiſt of them) as high as the aſh or withy, and meaſure more in the diameter; for oaken ſtems are ſtronger at root, and will hold growing longer than aſh, withy, or hazle. When hazle grows ſpriggy in the body, and ſhoots forth from the ſides of the bark, it is a ſign that it has given out, and done growing at the top.

Of the time of cutting coppices.

§. 24. Coppice-wood, in hedging and hurdling, wears much better and longer, if cut between Michaelmaſs and Chriſtmaſs, but ſells beſt in faggots, if cut between Chriſtmaſs and Lady-day, becauſe it ſhrinks leſs, and is moſt ſwelled, and looks beſt to the buyer: the method at Crux-Eaſton, and the hill-country thereabouts, is only to oblige the buyers to rid the coppice by Midſummer; they think the coppices are not harmed, if rid by the time the Midſummer-ſhoots ſpring up: they had not rid this year (anno 1697) by the latter end of July.

It was the firſt of May (anno 1701) and I propoſed to cut coppice-wood for the fire: my woodward ſaid, it would not hurt the ſtools to cut it ſo late, but it would never wear well in hedging nor burn well; for, after the firſt blaze was out, the coals would burn as dead as if water had been flung on them.

I had a doubt how I ſhould fence-in my corn and hay-reek I was going to make, Auguſt the 27th, (anno 1701) having no wood cut fit for the purpoſe, and ſuppoſing it too early then to cut for it.—But my woodward aſſured me, it was very ſafe to cut coppice-wood at Bartholomew-tide, and it did the mores no damage; and, ſaid he, all the farmers in the country, in the laſt year of their leaſe make a felling between Bartholomew-tide and Michaelmaſs, of all the underwood their leaſe will juſtify them in.

It is obſerved, that coppice-wood, cut for hedging at the latter end of winter, will not endure ſo long by a year as that which is cut at the beginning of winter: which, as I believe, may not only be becauſe the wood late cut, is cut after the ſap is riſen, or attenuated by the ſun, but alſo oftentimes becauſe it is not cut long enough before ſuch rarefaction is made; for, if a tree, or a cyon cut to be grafted, as Quinteny affirms, will endure many weeks of the winter out of the ground, or without being grafted, and, when ſpring ſhall come, it will by vertue of the ſap inherent in it, when attenuated, put forth buds for ſome time, till it dries away; ſo it follows, that the ſap inherent always in the ſtem of the wood, if not cut ſo early as to have long time to dry, may be put into motion at ſpring, ſo as to effect the above-mentioned inconvenience; therefore I hold hedging-wood and fire-faggots ſhould be cut in October.

My woodward ſays, he thinks it is beſt for coppice-woods to be felled the latter part of the year, about February or March; for, ſays he, if they be felled early in the winter, the froſts fall on their ſtools, and dries, parches, and ſhrinks them at the top, and obliges the bud at ſpring to ſhoot forth three or four inches lower than elſe it would do; whereas, if they be cut late, the bud will break forth at the top.—A ſhort time after, I aſked Harding of Holt the wood-merchant about it, and he agreed to the ſame.

It is a common practice of huſbandmen to fell their hedge-rows, and ſmall brakes within the grounds, thoſe years they ſow the grounds with wheat; but ſuch perſons ought well to conſider, firſt, whether ſuch land, after the wheat is off, will not bear a rowet too long for ſheep to eat, and, if ſo, great cattle muſt be put in to eat up the long rowet, and the ſooner the better for their tooth, and then attendance muſt be given by a cow-keeper by day, before the harveſt is in, and conſequently the wages the dearer, and when you may have many other offices to employ ſuch a perſon in: therefore, in ſuch caſe, my advice is to let the hedge-rows ſtand till after the wheat-crop be got in, when great cattle may be ſuffered to feed down the rowet without prejudice to the hedge-rows, and at that time of the year ſuch graſs is wanted by night, and, during the future three crops, it is to be ſuppoſed the rowet will not be ſo large, but ſheep may overcome it, nor will they very much prejudice the young wood.

Of the manner of cutting coppices.

§. 25. In your coppices, ſays Evelyn, cut not above half a foot from the ground; nay the cloſer the better, but ſlope-wiſe to the ſouth, fo. 149.

Of pollarding oak, elm, and beech.

§. 26. The oak will ſuffer itſelf to be made a pollard, that is, to have it's head quite cut off; but the elm ſo treated will periſh to the foot, and certainly become hollow at laſt, if it eſcape with life. Evelyn, fo. 151.

The beech is very tender of loſing it's head. Evelyn, fo. 152.

§. 27. The

§. 27. [h] The bark in the hill-country will not ſtrip ſo ſoon by a month as in the vale: again, in the ſame wood on the hill, there will be a fortnight or longer difference between the ſtripping of a tree, that is in proof, and one that is not: the ſap runs faſteſt up a tree in proof. Of ſtripping off the bark.

After ſtripping, when the bark is dry, it is high time to rid the wood of it, for, if a quantity of rain ſhould come, it would do it much hurt, and take off it's ſtrength, and then it would grow * finnowy: therefore the tanners, when they buy bark, hurry it away with all the carriages they can get, as they would to ſave corn from damage.

* Mouldy.

The ſap after open winters never runs well in barking-time at ſpring; for it ſpends itſelf gradually before-hand, and forwards ſome part of the branches of a tree when other parts ſtir not, and ſo all the branches will not bark equally alike: again, a hard froſt at the entrance of the ſpring, as this year (anno 1708) ſo as to check the riſing ſap, and diſturb it while it is riſing and ſpending itſelf, is a great hindrance to the kindly barking for that ſeaſon, and makes the ſap do it's buſineſs by halves; but a froſt ſome time before the ſpring does a kindneſs; in ſhort, the greater the fluſh of ſap (coming all at once) it makes the better bark, and is better both for the tanner and the ſtripper.

As I have obſerved before, the ſap in oaks riſes ſlower at ſpring, and the bark ſtrips worſe, and the tree that year makes worſe ſhoots, when in a lingering manner lucid days too early in the ſpring has often invited forth the ſap from the roots, which has as often received ſudden checks by cold, than when the beginning of the ſpring of the year continues cold, whereby the ſap in the roots continues filling and is kept from ſpending itſelf in the trunk and branches, till the uninterrupted heat breaks forth, and the fluſh of the ſap aſcends with continual ſolicitations by the heat: in like manner it is, I ſuppoſe, with leſs and tenderer plants; their ſhoots are ſtronger, the graſſy part more tender and groſs, when the backward ſpring carries afterwards an uninterrupted heat, than when the buds and ſhoots are earlier invited forth, and then ſtopped with the cold. We find all garden-herbs in like manner, which have ſlowly kept growing on all the winter, not ſo toothſome to the inſects as thoſe, the ſeeds whereof are not committed to the ground till ſpring.

§. 28. Between the annual circles doth ſome ſap ariſe, as is plain in a tree barked round, which yet will live; and the more porous this tree is between theſe annual circles, the longer that tree will live; as I have experienced in Of trees living when barked.

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[h] Mr. Miller obſerves, that the time for felling timber is from November to February, at which time the ſap in the trees is hardened; for when the ſap is flowing in the trees, if they are cut down, the worm will take the timber, and cauſe it to decay very ſoon, rendering it unfit for building either ſhips or houſes. He thinks therefore it would be more for the public benefit, if (inſtead of the ſtatute now in force for felling trees during the ſpring ſeaſon, when the bark will eaſily ſtrip) a law were enacted to oblige every perſon to ſtrip off the bark of ſuch trees, as were deſigned to be cut down in the ſpring, leaving the trees with their branches ſtanding till the following winter; which will be found to anſwer both purpoſes well.

walnut, and aſh; but holly and box have died in leſs than a year; for trees that hold their leaves, their wood is cloſe and compact between the annual circles, and that is the reaſon they die ſoon after being barked round, Cook, fo. 48.

Time of faggotting.

§. 29. I aſked my woodward the 13th of March (anno 1702) if it was not time to faggot; he replied, the wood-chapmen did not care to have their wood faggotted ſo early, till it had ſhrunk, elſe, after it was faggotted, it would be apt to ſhrink and fall to pieces: therefore, ſaid he, we faggot that wood firſt which was firſt cut.

Of pitching and ſtowing wood on the cart.

§. 30. In loading wood one man on the cart can ſtow to two men that pitch it up: therefore, where you cart wood by change of waggons, you do not find your horſes full employ, where but one man pitches.

Of drying laths before uſing.

§. 31. I cut down green timber in Auguſt (anno 1707) to ſet my lath-maker to work to make laths for immediate uſe: he deſired me to let him ſet them out a ſunning for four or five days before he bundled them up, or that I uſed them, that they might be dry; for, ſaid he, the timber being green the nails will ruſt, and ſo rot, and then break off, unleſs the laths were firſt dried.—And ſo ſaid the carpenter.

Of grubbing.

§. 32. Oak-underwood, and white-thorn are the worſt of any to grub; becauſe they both ſhoot their roots more downwards than any other.

It was the beginning of March (anno 1701) I agreed with two labourers to grub a hedge-row: they deſired they might go upon it preſently, before the ſap was got plentifully into the roots; for ſuch roots, if they were full of ſap, as well as their branches, would, they aſſured me, if cut then, though never ſo dry afterwards, burn dead, and make but a ſorry fire.

FENCES.

Maple bad for hedges.

§. 1. MAPLE, if it grows in hedges, will deſtroy the wood under it; for it receives a clammy honey-dew on it's leaves, and, when it is waſhed off by rain, and falls upon the buds of thoſe trees under it, it's clammineſs keeps thoſe buds from opening, and ſo by degrees kills all the wood under it. Cook, p. 72.

Advice to ſow haws.

§. 2. I would adviſe the country-gentleman to ſow many haws, &c. in his nurſery, that, where they grow thin in his hedges, and there are vacancies, he may dig up thoſe plants, earth and all, and carry them to fill up ſuch empty ſpaces. It will be good however to ſow theſe haws in poor ground, for, if tranſplanted from a rich ſoil to a poor one, they will not thrive well.

Of cutting black-thorn.

§. 3. The ſlow, or hedge-peak-buſh is apt to die in the hill-country, where the land is poor, and they are let to grow in the hedges till ſeventeen or eighteen years growth, before they are cut: therefore the beſt way of preſerving ſuch hedges is to cut them at eight or nine years growth. The ſtones of theſe alſo ſhould be ſown in nurſeries.—Mr. Evelyn excepts againſt black-thorn being mixed with the white, becauſe of their unequal progreſs.[a]

§. 4. By

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[a] Mr. Miller gives the following directions for raiſing quick-hedges.—The ſets ought to be about the bigneſs of one's little finger, and cut within about four or five inches of the ground; they ought to be freſh taken up, ſtrait, ſmooth, and well rooted. Thoſe plants which are raiſed in a nurſery are to be preferred.

Secondly, If the hedge has a ditch, it ſhould be made ſix feet wide at top and one and an half at bottom, and three feet deep, that each may have a ſlope; but, if the ditch be but four feet wide, it ought to be only two feet and an half deep; and, if it be five feet wide, it ſhould be three feet; and ſo in proportion.

Thirdly, If the bank be without a ditch, the ſets ſhould be ſet in two rows, almoſt perpendicular, at the diſtance of a foot from each other.

Fourthly, The turf is to be laid with the graſs-ſide downwards, on that ſide of the ditch the bank is deſigned to be made; and ſome of the beſt mold be laid upon it to bed the quick; then the quick is to be laid upon it, a foot aſunder; ſo that the end of it may be inclining upwards.

Fifthly, When the firſt row of quick is laid, it muſt be covered with mold, and the turf laid upon it, as before, and ſome mold upon it; ſo that when the bank is a foot high, you may lay another row of ſets againſt the ſpaces of the lower quick, and cover them as the former was done; and the bank is to be topped with the bottom of the ditch, and a dry or dead hedge laid to ſhade and defend the under plantation.

Sixthly, There ſhould be ſtakes driven into the looſe earth, at about two feet and an half diſtance, ſo low as to reach the firm ground. Oak ſtakes are accounted the beſt, and black-thorn and ſallow the next: let the ſmall buſhes be laid below, but not too thick, only a little to cover the quick from being bit by cattle, when it ſprings; and alſo lay long buſhes at the top to bind the ſtakes in with, by interweaving them. And, in order to render the hedge yet ſtronger, you may edder it, as it is called, i. e. bind the top of the ſtakes in with ſome ſmall long poles or ſticks on each ſide; and, when the eddering is finiſhed, drive the ſtakes anew; becauſe the waving of the hedge and eddering is apt to looſen the ſtakes.—The quick muſt be kept conſtantly weeded, and ſecured from being cropped by cattle; and in February it will be proper to cut it within an inch of the ground, which will cauſe it to ſtrike root afreſh, and help it much in the growth.

The following is Mr. Franclin's method of planting quick-hedges, as given us by Mr. Miller.

He firſt ſet out the ground for ditches and quick ten feet in breadth; he ſubdivided that by marking out two feet and an half on each ſide (more or leſs at pleaſure) for the ditches, leaving five in the middle between them; then, digging up two feet in the midſt of thoſe five feet, he planted the ſets in; which, although it required more labour and charge, he ſays, he found it repay the coſt. This done, he began to dig the ditches, and to ſet up one row of turfs on the outſide of the ſaid five feet; namely, one row on each ſide hereof, the green ſide outmoſt, a little reclining, ſo as the graſs might grow.

After this, returning to the place he began at, he ordered one of the men to dig a pit of the underturf mold, and lay it between the turfs placed edgewiſe, as before deſcribed, upon the two feet, which was purpoſely dug in the middle, and prepared for the ſets, which the planter ſet with two quicks upon the ſurface of the earth, almoſt upright, whilſt another workman laid the mold forwards about twelve inches, and then ſet two more, and ſo continued.

This being finiſhed, he ordered another row of turfs to be placed on each ſide upon the top of the former, and filled the vacancy between the ſets and turfs as high as their tops, always leaving the middle, when the ſets were planted, hollow and ſomewhat lower than the ſides of the banks by eight or ten inches, that the rain might deſcend to their roots; which is of great advantage to their growth, and by far better than by the old ways, where the banks are too much ſloping, and the roots of the ſet are ſeldom wetted, even in a moiſt ſeaſon, the ſummer following; but if it prove dry, many of the ſets, eſpecially the late planted, will periſh, and even few of thoſe that had been planted in the latter end of April (the ſummer happening to be ſomewhat dry) eſcaped.

The planting being thus advanced, the next care is fencing, by ſetting an hedge of about twenty inches high upon the top of the bank on each ſide thereof, leaning a little outward from the ſets, which will protect them as well, if not better, than an hedge of three feet, or more, ſtanding on the ſurface of the ground; for, as theſe are raiſed with the turfs and ſods about twenty inches, and the hedge about twenty inches more, it will make three feet four inches; ſo as no cattle can approach

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Of dead hedges near quick-ſets.

§. 4. By all means ſet your dead hedges at a good diſtance from your quick-ſet plants, not only on account of preſerving your plants, but your dead hedges alſo: for, if great cattle have any likelihood of reaching your plants, in reaching after them, and preſſing upon the dead hedge they will break it down a year ſooner than ordinary, and learning ſuch a habit, and finding the ſucceſs, they will not afterwards be broke of it.

For the two firſt years, ſays Mr. Evelyn, to diligently weed is as neceſſary as fencing and guarding from cattle.

Of ſprinkling young hedges with cow-dung and lime-water.

§. 5. To ſteep cow-dung and lime in water, and to ſprinkle young hedges with it, is ſuppoſed to prevent cows and ſheep from browſing them: and it is good to ſerve hedges the ſame with horſe-dung, where horſes feed, and when it is waſhed off by the rain, to renew it.—The end of mingling lime ſeems to be, to make the liquid ſtick, and to bind it.

Of thickening a hedge.

§. 6. If an hedge by ill uſage, or by age, be grown thin, the beſt way is to cut it cloſe to the ground the year you ſow it with wheat, and to fling earth to it, to refreſh it, and to make a dead hedge without it; by this means the old ſtems will tillow afreſh and thicken; whereas by plaſhing, unleſs a hedge be thick enough to afford the loſs of young ſhoots, by dropping on them, they will be killed. But in doing this you muſt not cover the ſtems with the earth you fling up, leſt you choke and kill them; if you intend therefore to lay a great quantity of earth to the roots you muſt leave the ſtems ſomewhat the longer.

The digging a trench or ditch by flinging freſh mold to the ſtools of an old hedge is of ſpecial uſe, foraſmuch as the trench, laying many of the roots of the old hedge bare, makes them ſend forth ſhoots, whereby the hedge is thickened; for roots turn to branches when expoſed to the air.

Take a well-rooted ſet of holly, of a yard long, and ſtrip off the leaves and branches, and cover them with a competent depth of earth, and they will ſend forth innumerable quantities of ſuckers, and quickly make a hedge.—Mortimer, fol. 4.—A holly or other ever-green, if ſtriped or blanched in the middle of the leaf, will in time loſe it's ſtripes, and the natural green will overcome; but, if the edges of the leaves are white, they will always ſo continue; therefore the latter is three times more valuable than the former, and this is the difference the gardeners make.

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the hedge to prejudice it, unleſs they ſet their feet in the ditch itſelf, which will be at leaſt a foot deep; and from the bottom of the ditch to the top of the hedge about four feet and an half, which they can hardly reach over to crop the quick, as they might in the old way; and beſides, ſuch an hedge will endure a year longer.—Where the ground is but indifferent, it is better to take twelve feet, for both ditches and banks, than nine or ten; for this will allow of a bank at leaſt ſix feet broad, and gives more ſcope to place the dead hedges farther from the ſets; and the ditches, being ſhallow, will in two years time, graze.

As to the objection, that taking twelve feet waſtes too much ground, he affirms, that, if twelve feet in breadth be taken for a ditch and bank, there will no more ground be waſted than by the common way; for in that a quick is rarely ſet, but there are nine feet between the dead hedges, which is entirely loſt all the time of fencing; whereas, with double ditches, there remain at leaſt eighteen inches on each ſide where the turfs were ſet on edge, that bear more graſs than when it lay on the flat; but admitting three feet of ground were waſted, he ſhews the damage to be inconſiderable. He then compares the charges, and aſſerts, that forty poles planted in the old way will coſt ſeven pounds, and the ſame meaſure in the new way but three pounds.

Of plaſhing a hedge.

§. 7. [b] In plaſhing a hedge, round a hedge-row or coppice, leave the plaſhers of the hedge withinſide the coppice, and turn the bruſhy part to the cloſe, that it may not injure the young ſhoots by dropping on them, and that the cattle may not come at the ſhoots of the plaſhers, and browſe them, and kill them.—Take care alſo to ſet the ſtakes outwardly, and off the ſhoots, whereas the hedgers for riddance, and for ſake of making ſtakes of the live ſtandards, work the plaſhed hedge ſtrait on, moſt likely through the middlemoſt part of the hedge, which muſt drop over your young ſhoots ariſing from the ſtools, and leave many without, expoſed to the ground, to be fed; though by this means you make the more luggs of hedge, yet the good huſbandry of it will repay you.—Plaſhing work for the moſt part ought to be ended early in April; becauſe, as ſoon as the bark looſens by the ſap, when the plaſh is bent back in the cut, it hollows, and gapes from the wood, and ſo is apt to die, becauſe the ſap cannot be conveyed to it. Withy and aſh will firſt take damage by late plaſhing, becauſe the ſap firſt riſes in thoſe kinds of wood. But as to the cutting down a quick-hedge, if it be the latter end of April, it will ſhoot as ſoon, if not ſooner than that cut in the winter.——It is too common to ſee withy and aſh-plaſhes dead in hedges, which comes from their being plaſhed too late.

It being froſty weather in November (anno 1700) yet my woodward was for going on with a dead hedge I was making: I ſaid, ſurely it would be very improper, and that the wood would not work, but would ſnap by means of the froſt.—But he anſwered, no, that was a miſtake, it was plaſhing that was improper in hard froſts.

The white-thorn in hard froſts will be ſo brittle as in bending to break like a rotten ſtick; but the black-thorn, withy, and crab-tree will endure bending in the hardeſt of weather.

As I was riding with Stephens, he went to pull up a large brier, which by it's length had bent downwards to the ground, and had at the end ſtruck forth plenty of new roots; from whence it may be obſerved how apt they are to propagate: I alſo conclude any other part of a brier that touches the earth will be apt to ſtrike new roots, and ſo it may be uſeful in ſome vacant places by plaſhing to encourage them.——In wet ſummers, when the ground is open and moiſt, as this year (anno 1703) they propagate abundantly; but in dry ſummers they are not ſo plentiful.

Of cutting an old hedge to thicken it.

§. 8. If an hedge has been in ill hands, and often bit, and abuſed by cattle, and is an old hedge; if you cut down this hedge, that it may thicken, and grow better, remember not to cut it down too low, not ſo low as the old ſtem, but leave ſome little length, about three or four inches of the thriving and younger wood ſtanding on the old ſtem, for, if you cut below that, the old ſtem often happens to be near rotten, and the tubes that convey it's juices to the young roots are but few, and their ſprings are eaſily loſt, if you divert them from their common current, and channel, and the coat and bark of the ſtem is commonly ſo caſe-hardened, that no bud can break through; whereas by leaving a little part of the young wood on the old ſtem you preſerve the old channels of the tree, and they carry a bark with them ſappy and eaſily perforable by a bud.——N. B. I once loſt a hedge by cutting it down too low.

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[b] In plaſhing quicks, ſays Mr. Miller, there are two extremes to be avoided; the firſt is laying it too low, and too thick; becauſe it makes the ſap run all into the ſhoots, and leaves the plaſhes without nouriſhment; which, with the thickneſs of the hedge, kills them.—Secondly, it muſt not be laid too high; becauſe this draws all the ſap into the plaſhes, and ſo cauſes but ſmall ſhoots at the bottom, and makes the hedge ſo thin, that it will neither hinder the cattle from going through, nor from cropping it.

Of ſtakes for fences.

§. 9. Oak-lops and hollow pollards cleaved make excellent ſtakes for fences, and, conſidering their laſtingneſs are the beſt huſbandry, or if two of theſe ſtakes are placed in each lugg, they will greatly preſerve the reſt of the hedge. Withy will rot the ſooneſt of all wood, and a ſmall hazle-ſtake will laſt longer in a hedge than a great withy: but an aſh-ſtake, next to oak, will laſt longeſt.

Of making a dead hedge too thick.

§. 10. I was walking between the coppices with my woodward, and he bid me take notice of a hedge on one ſide of the way, and ſaid, he had adviſed the making it ſo thin as it was, and it was now five years ſince it was made, and yet it ſtood well; whereas, ſaid he, by and by you will come to a fence-hedge of the coppice, not made longer ago, which is rotten and down; for your labourer would make it too thick, and cram in abundance of wood, whereby the wet lodged in it, and made it rot much the ſooner.

Hedges not to be made in froſty weather.

§. 11. Hedging ought not to be done in froſty weather, for with the bar they cannot make holes for the ſtakes to go into, but what ſtakes muſt be leſs than the bar, nor can they be drove farther than the pick of the bar; and upon the firſt thaw the hedge will ſink away and fall.

Of ſplitting rods for hedging.

§. 12. When you make a hedge, it is adviſeable to ſplit the rods, for you may obſerve the unſplit rods in a hedge grow ſpeckled by the ſap oozing through in ſpots, which opens and looſens the pores of the wood, and prevents it from clinging, and binding, as it does when ſplit; for then the ſun dries it up with all it's ſap, and is next of kin to burning the poſts-ends of gates; which dries the inmoſt ſap out of the poſts, that would rot them, and gives a cole of that depth to the outſide, through which the moiſture of the earth does not ſoak.

Time of mending hedges.

§. 13. In the ſpring, during March and good part of April, I find it very uſeful to view carefully all over thoſe ſort of hedges which may need repair, and not only mend where there is an immediate neceſſity, but whereſoever alſo they may decay before harveſt; as alſo all ſuch hedges, where though you can receive no treſpaſs till harveſt, by reaſon they border on other corn, or mowing-ground, yet are liable to it in harveſt, when grounds muſt lie open; theſe you ought to mend, for men cannot be then ſpared, nor can you then get wood.

Caution—not to let hedging-wood lie long in heaps on the ground.

§. 14. It is a common practice in the hill-country to cart hedging-wood, and fling it down in great heaps, perhaps half a load in a heap, and to ſuffer it to lie, perhaps a month or two, before it is hedged up, to the great detriment of the wood; which by ſo lying on the ground and receiving the rain and rime, which commonly fall there, and being imperviable to the wind and ſun to dry it, ſoon rots, and ſuffers more by ſo lying in ſuch thick wads a month or two in the field, than it would have done in three times the time in the coppice, where it lies on the roots, and is thereby kept hollow from the ground, and lies thinner, whereby the wind can ſoon dry it after rain.

Rod-hurdles not ſo good as thoſe of cleft timber.

§. 15. Farmer Farthing of the Iſle of Wight exceedingly commends the cleft timber-hurdles for a fold, and that they are beyond rod-hurdles; he ſays, he has had the experience of them both, and the former go much beyond the latter in cheapneſs, though at the firſt hand they are dearer: beſides, he ſays, with the rod-hurdles he has had a ſheep ſpoiled and ſtaked by leaping over the fold, and this he has known pretty often.

Of rods.

§. 16. The goodneſs of rods depends greatly on their ſtraitneſs without knots; ſuch will laſt half a year the longer for being ſo, beſides, the more knotty rods are, the more will the ſheep rub off their wool againſt them.

My labourers were twiſting ſome hazle-rods, which were apt to break, of which they complained: they were red hazle, not white; I aſked them the difference, they replied, it was very great; for the white hazle might be ſeen by the white bark, and the red by the red bark: the white hazle will twiſt ten times better than the red, being tougher, and conſequently abundantly better for all ſorts of hurdling work, and for the winding of a hedge, and for ſpars for thatching; nay, ſaid they, the white will laſt near a year longer in hedging. To this my woodman ſeemed to agree, and ſo did another experienced woodman, whom I talked with the next day; only the latter ſaid, he did not know that the white had any advantage of the red in hedging, but only in hurdling, where the rods were to be twiſted.

Of hedges.

§. 17. Where great cattle paſture never truſt to a patched, or a half made hedge, you will continually be making good the treſpaſſes, and the cattle will get a vicious habit, of which you will never after break them.

If a hedge needs patching, and is to be a fence againſt hogs or great cattle, eſpecially where water and ſhade are wanting, it is much the beſt huſbandry to make it all new, though the reſt may be tolerable, and ſome of it ſeemingly ſufficient for another year, for a declining hedge will decay more in a year than one can eaſily imagine; and if ſuch cattle find any one place of it weak enough to be forced, the ſtrongeſt part will never ſtand againſt them; ſo that you will be daily patching ſuch an hedge, and at times when you can ill ſpare a ſervant, ſuppoſe in hay-making or harveſt-time; and at laſt you ſhall have a continual patched hedge from year to year, wherein there will be ſome parts you will think too good to pull down, and yet no part of it good; whereas in mendings wood cannot be ſo well joined as when it is worked into an intire hedge at once.

Dividing open fields into incloſures by quick-ſet fences, where ten acres of ſtrong land is divided from thirty acres of light land, and the like, is a real improvement, in reſpect that a tenant will give much more for the lands ſo divided: whereas before the good land was ſwallowed up by the poor land;

nor could the light and poor land be ploughed as often as the ſtrong land, nor the ſtrong land ſo ſeldom as the poor land, without reciprocal inconveniency.

If your corn-grounds, that lie contiguous, are well fenced againſt each other, you will have thereby the advantage, as ſoon as the corn of one field is rid away, to put in cattle, or hogs, to eat up both the graſs and looſe corn; whereas otherwiſe your cattle may be kept out a great while, when they need it, till other ground be rid.

ORCHARD or FRUIT-GARDEN.

Not to ſteep ſeeds except ſome annuals.

§. 1. DO not ſteep ſeeds of trees in water, as ſome may adviſe you; for it is not good to ſteep any ſort of ſeed, unleſs ſome annuals, and to ſteep them is good, eſpecially if late ſown: but to ſteep ſtones, nuts, or ſeeds, that are not of quick growth, in water may kill them, by making the kirnel ſwell too haſtily, and ſo crack it before the ſpear can do it, or it may mould or ſtupify the ſpear. Cook, fol. 63.

§. 2. The antients always preferred orchards to paſtures, and paſtures to arable. See Varro, fol. 32.

Of planting apple-trees in the hill-country.

§. 3. In our hill-country, where we are on cold clays, or elſe the earth is ſo poor that it's vegetable particles are not copious, nor very active, it has been obſerved that apple-trees are very hard to be raiſed, unleſs the crab-ſtocks be planted where they muſt remain two years before they are grafted, or rather unleſs the crab-kirnels be ſowed where they are to continue unremoved, and ſo grafted.—Probably the reaſon for this may be, becauſe there is a conſiderable knot of tranſverſe fibres where the graft is jointed, through which the juices and vegetable particles find it a very hard taſk to paſs, where the juices of the ground are cold, as in clay-lands, or the particles of vegetation leſs copious and active, as in poor lands, eſpecially when the ſtock itſelf being planted after it's being grafted, muſt be ſuppoſed to receive a check, and it's tubes ſome ſtreightneſs by cloſure, and therefore cannot admit a free paſſage of juices upwards to the graft: whereas when the ſtock has been planted two years, and it's roots ſettled, the juices may have a vigorous paſſage, and ſo can eaſily force their way through the fibres where the graft knits: yet where there is a mellow ground, or a rich fat ſand, there the vegetable corpuſcles riſe ſo ſtrongly and plentifully, and the juices of the earth are ſo thin, that they can eaſily paſs upward to the graft through the knot, and in ſuch a happy ſoil a tree planted after being grafted may do well.

Of tranſplanting crab-ſtocks.

§. 4. I by no means think well of removing crab-ſtocks out of the woods and tranſplanting them; becauſe ſuch ſtocks, when they come to be expoſed to the open air, and taken out of their ſhelter in the warm woods, do not bear the cold winters well, nor even the ſummer ſuns.

Of cuttings for planting.

§. 5. Your cuttings for planting ſhould be from half an inch to a whole inch diameter; for, if they be leſs than half an inch, they will be weak and have a great pith, which will take wet and be likely to kill your cutting; and beſides, when your cuttings are too ſmall, they are not prepared with thoſe pores, that is, little black ſpecks on the bark, where the roots break out, if ſet in the ground; a ſign that thoſe that have that mark on them will grow, as elder, alder, ſallow, water-poplar, &c. and if they be too young they will not have that burry knot which is very apt to take root: and if they are above an inch diameter the tops of your cuttings will be long in covering over, and ſo may decay by the wet. Cook, fol. 12.

Of grafts. §. 6. The French gardener tranſlated by Evelyn, fol. 54. ſays, the beſt grafts are thoſe which grow on the ſtrongeſt and maſter-branch of a tree, and which are wont to be good bearers, and ſuch as promiſe a plentiful burden that year, being thick of buds; for hence it is that your young grafted trees bear fruit from the ſecond or third year, and ſometimes from the very firſt; whereas, on the contrary, if you take a graft from a young tree, which has not as yet born fruit, that, which you ſhall propagate from ſuch a cyon, will not come to perfection a long time after.

I went with my gardener into my crab-ſtock nurſery, to chooſe ſome ſtocks for grafting on: I had ſome that came from another nurſery, and others that I had raiſed from crab-kirnels, but had never been removed; theſe ſeemed to be the moſt flouriſhing, and on theſe I would have had him grafted; but he refuſed, ſaying, that they had only a tap, but no fibrous or buſhy roots, and therefore, when removed, would not be able to feed their ſtock and graft. —Note, ſuch ſtocks removed may be well able to maintain themſelves, but it is a different thing to maintain their grafts, and forcibly tranſmit juices enough thro' the knot of the graft, where the fibres run tranſverſe.

Cyons grafted upon ſuckers are more diſpoſed to produce ſuckers than grafts on the main ſtocks do. Ev. 140.

In January or February, as you find the weather grow warm, the wind neither being north nor north-eaſt, you may graft cherries or plums, but not apples till the bark of the ſtock will riſe or peel from the wood, which is ſeldom before the middle of March, and often not till April: this is the beſt way of grafting them, but if you will graft apples in the cleſt, you may do it ſooner. Lang. fol. 46.

The great uſe of grafting by approach is, where trees (ſuch as the vine, or ever-greens) run ſo much to juice, that the graft cannot eaſily conſolidate to the ſtock by reaſon of the great fluidity of ſap; there by length of time and patience it will conſolidate by approach.

Of budding. §. 7. I gathered withy-ſhoots over which the cart-wheel had run, and preſſed them flat, in which ſhape they continued to grow, and the ſap ſwelled through their fibres, and riſing higher there than in other places of the bark, plainly ſhewed, that the ſap is conveyed by thoſe fibres, to each of which in their progreſs broke forth a bud ſooner or later, and it was to be obſerved that the fibre leſſened extreamly as it paſſed on, after it's having ſent out it's bud, not being able farther in it's whole progreſs to ſend out another; for all buds that appeared above being well obſerved, could be perceived to be collateral, and to belong to ſome parallel fibre, though ſometimes the bud above might ſeem to turn athwart the fibre of the lower bud, and hang perpendicularly over it.—From hence may appear the reaſon why an inoculated bud may not take, viz. becauſe it is not placed on a fibre; therefore care is to be taken to place the inoculated bud perpendicularly under another bud, that it may be fed, and not over, leſt the under bud weaken the fibre that paſſes from it, and it ſhould not be able to feed the inoculated bud.

Mr. Bobart of Oxford tells me, he once inoculated a bloſſom-bud of an apricock, and the bloſſom grew to be a ripe apricock.

To bud a walnut-tree, when five or ſix feet high, doth not alter the property of the wild kind, but makes the tree more naturally bear fruit, both ſooner and better too. Cook, fol. 61.

I know Lord Bacon tells you, that peaches come beſt of ſtones unbudded; but I adviſe you to bud all you raiſe of ſtones, ſeeds, &c. though it be to take a bud off from the ſame ſtock, and to bud it on that, as I have often done. Cook, fol. 61.

Currants and gooſeberries may be inoculated on their own kind. Mortimer, fol. 455.

Of pruning.

§. 8. As good pruning helps the growth of trees, ſo alſo doth it prolong their lives: for it is well known that the pruning ſome annual plants will make them laſt more than one year. Cook, fol. 1.

Le Gendre ſays, a gardener ought not to prune the large ſhoots of ſome trees, ſuch where the ſap is very plentiful by being in good ground; for, if the ſap be ſtopped ever ſo little, it will caſt itſelf into the buds, which would have born fruit, and make them grow into wood; therefore he ought to manage it ſo as to leave neither the foot nor body of the trees too much unfurniſhed; for this reaſon he muſt rather cut the tall-ſhooting branches, unleſs in the caſe above, too ſhort than leave them loo long, taking moſt from the higheſt branches, and ſuch as are towards the top of the wall, becauſe theſe draw all the ſap to themſelves, and leave the bottom of the tree unfurniſhed: this is the cauſe that peach-trees are ſo difficult to be kept, experience teaching us, that, if the gardener does not perfectly underſtand the way of cutting them, and taking their ſprouts away as they ought to be, they will be ruined in ſix or ſeven years. fol. 127.—Trees, to be well pruned, muſt have their boughs every year refreſhed more or leſs, according to their force, by cutting away the wood that ſprings in the month of Auguſt, which being the ſhoot of the latter ſap, cannot be ripened, unleſs it be neceſſary to preſerve it for want of better, or that it be found to be ſtrong and well nouriſhed. fol. 127. —Thoſe boughs alſo that ſhoot too faſt muſt be ſtopped and kept ſhorter than the others, for they draw all the ſap to them and wrong the reſt that are weaker: but the maſter-bough muſt always be preſerved, being that which grows ſtrait upwards, ſo ſtopping it from year to year that it may always be the ſtrongeſt, and maintain the ſhape of the tree: thoſe boughs alſo, which are weak and ſmall, muſt be ſhortened, and thoſe, which are diſpoſed to bear fruit the following year, to the end that they may grow ſtrong, and that their buds may be well nouriſhed. ib.—It is farther neceſſary to prune thoſe branches that are full of fruit-buds, for too great a quantity of bloſſoms conſumes the tree, beſides that from thence the fruit comes leſs fair; but in the pruning of theſe it muſt be obſerved to cut them above a leaf-bud, and as near to it as may be, for two reaſons, the firſt is, becauſe by that means the fruit will profit moſt, for, when it is not covered with leaves, it dries, and ſeldom arrives at it's natural perfection: the ſecond reaſon is, becauſe ſo the branch will recover itſelf that very year; whereas, if it be cut higher, and far from a leaf-bud, there will remain a little ſtub at the end of the twig, which dries up, and cannot recover itſelf in two or three years: as for ſuch boughs as are taken wholly off, they muſt be cut as near the ſtem as may be, for ſo they will recover the ſooner, and that without making any knot. fol. 129.—The pruning of peach-trees muſt be the laſt of all, and then, when they begin to ſpring, and are ready to flower; becauſe their young wood is ſo tender, that, if it be cut, it will be dried and ſpoiled upon the leaſt froſt, from whence a great many of the ſmaller twigs die, and muſt oftentimes be cut again. ib. —Plum-trees and cherry-trees muſt not be cut, or ſtopped on the ſap, but only cleared and diſcharged of their uſeleſs wood within the tree: and for this reaſon they are not proper to be kept as buſhes or dwarfs. fol. 131.

Some trees are ſo apt to run to bearing, that thereby they will ruin themſelves in a very few years; to diminiſh this, their heads muſt be cut off, or their boughs ſhortened to the half, and for two or three years all their buds taken off, for by this means, provided their roots be lively, they will grow much into wood. Le Gendre, fol. 149.

Of nailing.

§. 9. It will be neceſſary every year to prune and nail wall-fruit to the wall twice or thrice, according as they grow more or leſs, in doing which you muſt obſerve, to bend down the ſtrongeſt ſhoots that would grow upwards, towards the ſides, otherwiſe they will be apt to run ſtreight upwards, and not cover the ſpace you deſign for them, and by their luxurious growth will extreamly rob the ſide-branches of their nouriſhment; there will branches enough ſpring out freſh to run upwards out of them when they are ſo bowed. Langford, fol. 54.

Of dunging apple, peach, and apricock-trees.

§. 10. A tree, ſays Le Gendre, draws it's nouriſhment only from the ſmall roots. fol. 136.—When it is neceſſary to dung apple-trees, peach-trees or apricock-trees inoculated on a plum-ſtock, or pear-trees grafted on a quince-ſtock, it is enough to ſpread the dung upon the ground ſix feet about the ſtem, and ſo to dig and work the earth and it well together, for theſe ſpreading near the ſurface of the earth are eaſily ſenſible of the amendment. fol. 138.

Many farmers in the Iſle of Wight threſh winter-vetches for their breeding-pigs, and give them to them in the winter; and one that I know in particular gives them the vetches round about his apple-trees, and ſays, their ſoiling, or nuſling, and keeping the graſs and weeds down, or digging and hollowing the ground, is the reaſon why his orchard brings apples every year when others fail.

§. 11. In cold countries both the bark of trees, and the rind of fruit is thickeſt: ſo it is plain of latter peaches, &c.

Eaves ſerviceable in bloſſoming-time.

§. 12. [a] This ſpring (anno 1708) was very wet and cold, with froſty mornings, eſpecially at apricock and peach-bloſſoming time, inſomuch that rain would fall in the night and freeze in the morning; the conſequence of which was, that apricocks were ſix and eight ſhillings a dozen: but an ordinary neighbouring-man to me, who had an apricock-tree next his houſe, being watchful of moſt contrary ſeaſons, and finding the benefit of nurſing his tree under difficulties, did by night cover it with rugs and blankets from the rain, the conſequence whereof was, he had thirty dozen of apricocks on his tree: his name was Timothy Skrine of Broughton near me in Wiltſhire.—I alſo obſerved that year in ſome few places ſome thatched eaves, which hung a foot and an half over ſome garden-mud-walls, where were good ſtore of apricocks and peaches; and I judged they owed their fruitfulneſs to theſe cauſes, for they were thus ſhaded from the rain, which falling at night into the bloſſoms of others, and congealing, burned them up and mortified them; and how they piecemeal mortified, the morning after was very viſible.—The 17th of Auguſt I was at Oxford in Mr. Bobart's phyſic-garden; I related the matter to him with my reflections on it.—He was pleaſed with the relation, and ſaid, he would carry me to an object which ſhould confirm my opinion: he ſhewed me the houſe he lives in, planted on the walls of the phyſic-garden, on which walls, as far as his houſe goes, is a large eaving to his houſe, which ſaved his peaches from the north wind and the rain, ſo far as his houſe went, and ſo far he had good ſtock of peaches on ſeveral trees, but no farther; and the end of his houſe reaching to the middle of a tree, the fruit ended there.

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[a] This obſervation is agreeable to the inſtructions given by Mr. Miller, under the article Blight.—"There is a ſort of blight, ſays he, againſt which it is very difficult to guard our fruit trees; this is ſharp pinching froſty mornings, which often happen at the time when the trees are in flower, or while the fruit is very young, and occaſion the bloſſoms or fruit to drop off; and ſometimes the tender parts of the ſhoots and leaves are greatly injured thereby. The only method yet found out to prevent this miſchief, is, by carefully covering the walls, either with mats, canvas, reeds, &c. which being faſtened ſo as not to be diſturbed by the wind, and ſuffered to remain on during the night, by taking them off every day, if the weather permits, is the beſt and ſureſt method that hath yet been uſed in this caſe; which, although it has been ſlighted and thought of little ſervice by ſome, yet the reaſon of their being not ſo ſerviceable as has been expected, was, becauſe they have not been rightly uſed, by ſuffering the trees to remain too long covered; by which means the younger branches and leaves have been rendered too weak to endure the open air, when they are expoſed to it; which has often proved of worſe conſequence to trees than if they had remained intirely uncovered. Whereas, when the covering before mentioned has been performed as it ought to be, it has proved very ſerviceable to fruits; and many times, when there has been almoſt a general deſtruction of fruits in the neighbouring gardens, there has been a plenty of them in ſuch places, where they have been covered: and though the trouble may ſeem to ſome to be very great, yet, if theſe coverings are fixed near the upper part of the wall, and are faſtened to pullies, ſo as to be drawn up, or let down, it will be ſoon and eaſily done; and the ſucceſs will ſufficiently repay the trouble."

The latter part of Mr. Liſle's obſervation may ſeem favourable to horizontal ſhelters, but, if rightly conſidered, it implies no more than Mr. Miller has allowed; for it is far from concluding that they ought to be fixed and conſtant, or that walls ſhould be built in that manner, nor does it aſſert any thing of the goodneſs of the fruit, but only of the quantity. He brings theſe inſtances of the projecting eaves to confirm the opinion he had delivered before, viz. that the plenty of fruit that year on ſome trees was owing to their having been protected from cold winds, rain, and froſts, in the time of their bloſſoming; but, notwithſtanding this, fixed horizontal ſhelters may, at other times, and in other reſpects, be very prejudicial both to the fruit and the trees, as Mr. Miller has ſhewn both from reaſon and experience.

Plums that come from the ſtone chop in cold wet weather, others do not, and why.

§. 13. This year (anno 1720) the ſpring and ſummer to Auguſt the 13th (when this was wrote) was often very rainy, and the days for the ſeaſon of the year very cold, it was obſervable, that in my kitchen-garden, where the land was very good, the plums which were ſtandards, and did cleave from the ſtone, ſuch as the Orleans, the Damaſcenes, the Queen-mother, &c. did all chop in ſeveral places, not, as I believe, one plum on a tree excepted, and gum iſſued out of the chops: but a violet-plum, a ſtandard there, which is a plum that does not cleave from the ſtone, did not in the leaſt chop: it was farther obſervable that ſuch plums as grew againſt the walls, and did cleave from the ſtone, though they grew againſt a north-weſt wall, did none of them chop. —And the ſame obſervation I have made other years, in cold and wet ſummers: it may alſo be added, that the ſoil in my kitchen-garden was full as good, and as well maintained as the borders of my plum-trees againſt the north-weſt walls: from this experiment I draw the two following concluſions, viz. that the reaſon why the plum that did cleave from the ſtone in my kitchen-garden did chop, was, becauſe ſuch plums, which cleave from the ſtone, are of a drier pulp and do not overflow ſo much in juice as the violet-plums do, and thoſe which do not cleave from the ſtone; and therefore, through the wet and cold ſeaſons of the year, the ſpirituous juices, which can only ſtrain through the ſtalk of the plum, being not rarified, through want of heat, could not aſcend, and ſo thoſe plums, dry in their nature, being now made more ſo, for want of moiſture chopped: but moiſture enough aſcended the violet-plum, though leſs than in other years, which by nature overflowed with juice, to preſerve that from chopping.

The ſecond concluſion is, that the much rainy and cold weather, to both which the ſtandard-trees were expoſed, was the only reaſon and cauſe of this circumſtance of the chop in the aforeſaid plums, and made the difference between the ſtandard-plums, and the plums againſt the north-weſt wall; for though the ſituation againſt ſuch expoſition one may think very cold, as not having ſo much benefit of the ſun from all quarters, eſpecially from the eaſt and ſouth aſpect, as the garden-ſtandards had, by which means the garden-ſtandards were on as good, if not better footing in hot and dry ſummers, yet in ſuch a cold and wet ſummer as this was, the cloudy weather which intercepted the ſun, and the cold windy and rainy weather, from which the plums under the north-weſt wall were very much defended, ſo chilled the juices, as to produce the ill effects above-mentioned.

I have ſeen fruit-trees ſtanding in hedges palliſade-wiſe, in ſome particular part of which hedges, poſſibly for a lug or two, the trees every year blighted: I have known new earth to be laid to the roots, and the old to be removed without effect: then I have known new trees to be planted in their room, yet ſtill the evil has continued. In ſuch caſes I have always obſerved the poſition of the place to be the diſeaſe, either that there has been a repercuſſion of an eaſterly wind from a piece of wall on the place, or ſome angle which has turned the ſtrength of a malignant wind on it, which cauſe being removed the effect ceaſed.—I was ſpeaking to Mr. Bobart of this, and he ſaid, that London the king's gardener had told him, that he was at Verſailles, and obſerved that the king of France for this reaſon could have no fruit [b].

GARDEN.

§. 1. THE common damaſk-roſe is the antient inhabitant of England. Mortimer, fol. 477.

Of the roſe.

I was telling my gardener how much fruit depended on the leaves of the tree, &c.—he added, that in the monthly roſe he could ſtop the progreſs of it's bloſſom a month by pulling off the leaves of the tree; for it would not blow again till it had put forth freſh leaves.

Of woodbines.

§. 2. The woodbines or honey-ſuckles in my borders have not thriven, but for the moſt part died yearly, and I have been forced to renew them; I firſt thought our country was too cold for them, but at length I was rather inclined to think our ſoil was too dry and too hot, our garden being much expoſed to the ſouth ſun; ſo I laid heaps of graſs to the roots, and quickly found it to have ſucceſs.——Agreeable to this ſeems Mr. Ray, Hiſtoria plantarum, vol. 2. fol. 1490. Hæc ſpecies in ſeptentrionalibus regionibus, Germaniâ, Angliâ, Belgio, &c. in ſepibus frequens.

Of ſalt laid on gravel walks.

§. 3. I would have thoſe that lay ſalt on their gravel-walks, to kill the weeds, to obſerve, if in a few years they do not produce more weeds than thoſe gravel-walks that had had no ſalt laid on them did. For the ſalt at firſt ſtupifies the roots, as being more than they can digeſt, till waſhed in by the rain and qualified. Cook, fol. 18.

KITCHEN-GARDEN.

Of improving plants by removing them.

§. 4. Worlidge, fol. 257. ſays, removing of plants, and alteration of the ſoil is a good way to improve them; ſeveral eſculents grow the fairer for it, as cabbages will not leaf well in caſe the young plants be not three or four times removed before the ſpring, the ſame is obſerved in lettice, onions, and ſeveral others, if they are removed into improved earth every time, they will eat the tenderer and finer.

Aſhes good manure for artichokes.

§. 5. Columella recommends aſhes to be laid on artichoke beds, which he ſays is extreamly beneficial to that plant[a]. But Mr. Powel the gardener was a ſtranger to the agreeableneſs of that manure to them.

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[b] See the article, Water and Watering, from §. 5. to the end.

Of keeping artichokes.

§. 6. The latter artichokes will keep to autumn, if you cut them before they are ripe or going to blow, but it muſt be in a dry ſeaſon, and when they are very dry, and hang them up in a cellar; for they will keep growing on, and blow, and ſeed: I have known them kept ſo two months; or you may cut the ſpring-artichokes when half ripe, and then they will bear again at autumn.

Of carrots and parſnips.

§. 7. Carrots and parſnips are ſaid to delight in different ſoils; viz. carrots, in ſandy and the lighteſt ground, parſnips, in the ſtrongeſt land.—Mr. Ray agrees to this, for he ſays, the carrot delights in gracili ſolo, but the wild parſnip in ſolo pingui & opulento. It is a good property in a carrot to be thick and ſhort.

If carrots and parſnips are not gathered as ſoon as they come to their perfection in growing, which is to be known by the withering of their leaves, the worm will eat them, which will cauſe a canker.

Of cabbages.

§. 8. One of my labourers put me in mind of earthing up my cabbage-plants; I knew they would thrive the better for it; but he ſaid, it would make them take freſh roots, whereby they would better in their ſtem ſupport their cabbage-heads, which otherwiſe would be flung by the wind.

Of tranſplanting herbs.

§. 9. Markham in his book of huſbandry, and ſkill in cookery, p. 51. ſays, that herbs growing of ſeeds may be tranſplanted at all times, except chervil, orage, ſpinage, and parſley, which are not good after being tranſplanted; but obſerve to tranſplant them in moiſt and rainy weather.

Of liquorice.

§. 10. Glycirriza, or liquorice, Mr. Ray ſays, rarius autem in Germaniâ aut Angliâ floret, ideoque ſterilis a nonnullis ſed temerè credita. Now Engliſh liquorice being the beſt, ſhews plainly the perfection of the root has no affinity with the perfection of it's taſte; for no doubt but the root of liquorice grows more perfect, that is, larger, in thoſe countries where the plants flower and bear fruit, though there it may eat more ſticky and ſtringy, and be leſs pleaſant in taſte: ſo that the perfection in the taſte of the root may be a defect in it.

Of onions.

§. 11. Sharrock in his book of vegetation ſays, that Engliſh ſeed of onions brings but ſcallions or ſmall onions. I find this to be true, and that they will not keep long, but grow ſoft, and rot in three weeks time after they are taken up.

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[a] Cinara multo cinere ſtercorandum, id enim ſtercoris huic oleri videri aptiſſimum. Columella.

WEEDS.

Of foddering with weedy ſtraw.

§. 1. FARMER Chivers of Gauſuns in Wilts ſays, the thiſtles came at firſt there, as in other rich paſtures, from the ill huſbandry of the farmers, who in hard winters foddered with thiſtly ſtraw, or thiſtly coarſe hay, and from thenceforward they have increaſed to a great degree. —I remember that by foddering in my meads, in a very dry ſummer, with goar-vetches, I filled my meads with morgan and other trumpery.

Of poppy or red-weed.

§. 2. Poppy or red-weed ſeldom grows in the deep and wet lands of Hants, nor in the deep lands in Leiceſterſhire, nor indeed do the plants which come up from the ſmalleſt ſeeds, ſuch as rue, whitlow-graſs, &c. grow in ſtrong lands, but in the lighteſt lands, which are conſequently the barreneſt; becauſe thoſe ſmall ſeeds are eaſily oppreſſed in ſtrong or wet lands, nor are the vegetative particles heated, and thereby refined enough to penetrate the pores of their ſeeds.

Of killing weeds.

§. 3. The farmers do not in the laſt crops lay down their lands to clover in the ſtrong and deep ſoils of Northamptonſhire, becauſe they would then be prevented (if they made any benefit of their clover the next ſummer) of taking ſo effectual a remedy by an early ſummer-fallow, and after that of giving their lands a ſecond tillage, perhaps to deſtroy the withwind (which I have often obſerved to trouble them) and other ſuch ill weeds as are apt to grow up with their wheat, if not ſubdued by an early ſummer-fallow. After all it muſt be confeſſed, that nothing is better huſbandry in our ſtrong clay-grounds in the hill-country than to keep them in tillage, and not to ſuffer them to run to a ſword of natural graſs, which is prevented by ploughing up the firſt ſummer's clover to a wheat-crop, about the beginning or middle of Auguſt, after you have in a manner had the benefit of the ſummer-crop; and yet this practice is ſubject to the inconveniency of cultivating the weeds ſuch ſort of land is ſubject to, eſpecially when it ſhall be folded or dunged, as wheat-land ought to be. Therefore it ſeems a medium ought to be taken in this caſe, and you ought to obſerve carefully what ſort of ground is ſubject to what ſort of weeds; for ſome of my clay-grounds are not ſubject to withwind, and ſome of my light and white grounds are not ſubject to morgan or red-weed as others are, and yet I can ſee little difference in the grain of the land; accordingly you may ſuit your huſbandry, in humouring your grounds, and venturing the aforeſaid method in one ground, which for the foregoing reaſons you ought not to riſque in another: again, it often happens in our hill-country-land, we have ſeveral ſorts of earth in the ſame field, as ſtrong red clay, ſome mixed earth, and ſome white; in ſuch caſe, when in the courſe of huſbandry you ſhould lay down your laſt crop of corn to clover, you may forbear ſowing that part of the field which is of ſtrong clay to clover, that you may not be hindered from doing that which perhaps may be moſt for your benefit; viz. of giving it an early ſummer-fallow in order for a wheat-crop.

Again you muſt be nicely careful of giving ſuch lands as are ſubject to weeds the firſt froſty fallows of the winter ploughings every year that they are ſown to barley, oats, or peas, in caſe you fallow for peas: by this method you will in time gain in a great meaſure a dominion over thoſe ſorts of weeds, which otherwiſe would eat out and overtop your corn.

Sowing clean ſeed, and laying grounds down to graſs-ſeed, will at length overcome all manner of weeds, whereby the heart of the ground is eaten out, and the more in heart yon accuſtom to lay down your grounds to graſs-ſeed, the thicker the graſs or clover will grow, and the better effect it will have.

Mr. Ray ſpeaking of ludweed (with which the fields at Crux-Eaſton are very much troubled) ſays, it grows chiefly on dry, barren, and gravelly ground.—If ſo, it ſeems it may be extirpated by improving the land by good huſbandry: and it ſeems to be the ſame with all other plants that affect barren and poor ground; the juices being poor and ſour that they feed on, they go off of courſe by making the land generous: and indeed good healthy land ſeems much eaſier to be cured of the weeds incident to it than poor land, without altering the condition and property of each ſort, becauſe colt's-foot, docks, wild carrot, parſnip, &c. excepting the thiſtle and knapweed, may eaſily be deſtroyed by being prevented from feeding; whereas the plants of barren grounds being both ſmall and infinite, the labour of deſtroying them would be alſo infinite without altering the property of the ground. Therefore the conſequence of ploughing lands hard is very diſcernable, as alſo of how great conſequence it is ſometimes to feed meadow-lands for a year or two, thereby to deſtroy thoſe weeds which are annual by preventing them from feeding.

Sharrock however in his book of vegetation, fo. 141. ſays, that the plants which annually die, if they are diſappointed of running to feed, will continue and ſurvive many years, even till they are permitted to run to ſeed.—If ſo, the feeding of meads, and cutting thiſtles, &c. in order to deſtroy annual weeds, may not be ſo effectual as above propoſed.

The meaſures to be taken in the three ſeaſons of the ſummer for cutting of weeds ſeems beſt to be taken when they are fulleſt of ſap, which we may judge of by the ſtripping of oak, which is moſt in ſap in the breaking out of the bud into a leaf, before the leaf be full grown: and ſuch half-grown leaves, by reaſon of their fulneſs of ſap, the froſt ſeizes ſooner than the others: ſo that the weeds ought to be cut down when the ſap is moſt in the root, viz. at ſpring, Midſummer, and Michaelmaſs-ſhoot, which is on the full ſwelling of the bud.

Our farmers ſay, one need not regard what weeds come up in the ſummer-fallows, or when one ſows wheat; for thoſe weeds and May-weed will all be killed by the winter, but it is the weeds that come up in the ſpring that do the harm.

Why wet brings up weeds and not corn.

§. 4. If much wet brings up weeds, how comes not the corn alſo to thrive in wet weather? The reaſon is, becauſe many weeds are natural to wet ground, ſuch as colt's foot, docks, thiſtles, &c. and to cold clay; the wetter therefore the year proves the more ſuch plants will grow to the maſtery of the corn: but wet ſeaſons agree with no ſort of corn: God having ordered that man ſhould live by the ſweat of his brow, has given that general defect to land, as to ſtand in need of being laid dry by art and tillage.——According to what has been ſaid, lands lying aſlope to the north from the ſun, will be the more ſubject to weeds.

Why wheat ſown dry becomes weedy.

§. 5. It is the obſervation of country-farmers, that, if the ſeaſon of ſowing wheat be dry, it brings many weeds into the corn:—becauſe the ſeeds of weeds have a moiſture in them by lying ſo long in the ground as eaſily makes them grow when the ground is made fine for them; whereas the corn, being put into the ground as dry as may be, cannot by that little moiſture of the ground grow, and ſo the weeds firſt ſet out ahead of the corn: beſides the ſeeds of many weeds by much wet may burſt, as it is in many garden-ſeeds.

Caution not to weed corn when near in ear. See §. 10. 12.

§. 6. It is commonly ſaid, by thoſe who forbear to weed their wheat till it is quite, or almoſt in ear, that what is trod down or bent will riſe again: but I weeded my wheat in the beginning of May, at leaſt three weeks before it was in ear, and on the 23d of May I walked by the ſides of the corn, and ſaw many of the bent and trodden down blades, which it was impoſſible ſhould riſe: I found in the bending of all of them, where they had been broken down, the juices in that bending turned black, and became an iron-mould, which in all probability before harveſt might rot them off: I found all ſuch blades mounted upwards from the firſt joint above the bending, making directly upwards towards the ſun, as the young ſhoots of trees fallen down will do, and the bended head of a pea, as it ſhoots out of the ground, which riſes upright in the blade, making a right angle in that joint; and ſo it is to be obſerved that barley blighted by being * more-looſe does, which falling down at the root, the blade in like manner bends inwards at the firſt joint above the root: undoubtedly therefore ſuch weeding corn ſo high does it harm; it would be worth the obſerving at harveſt what ears ſuch corn produce, as alſo whether the blades trod down to the north and facing the ſouth do not riſe more upright to meet the ſun, than thoſe trod down towards the ſouth do in riſing towards the north, and ſo from other points of the compaſs: as we tread down onion, turnip and carrot-tops to ſtrengthen the roots, and to weaken the heads, think you not it does the ſame to wheat? and conſequently the bruiſing and treading it down muſt be prejudicial to the corn.

*Looſe at root.

Some corn does not want weeding like other corn.

§. 7. There is not always the ſame reaſon for weeding corn, though the weeds may be as full ſet at one time as at another: for ſometimes one is ſure the ground is in very good heart, and the weeds, by coming up late, are not ſo; it often happens that the corn ſtarves the weeds and overcomes them; but, if the land is poor, ſo that the corn ſhall be danger of falling off, the danger will be of the weeds ſtarving that.

What corn chiefly to be weeded.

§. 8. Special regard ought to had to the weeding of ſuch corn, which ought not to lie long abroad in the field after it is cut, ſuch as white oats, barley, and wheat; becauſe they will not bear to lie out ſo long, as that the weeds cut with them may dry without damage; whereas black oats and peas, the firſt may lie out without damage till the weeds are dry, and peas muſt, to be dry themſelves, lie out as long as the weeds may be dry alſo: however, it is beſt to weed oats.

Of weeding a ſecond time.

§. 9. If you know a ground in it's own nature ſubject to poppies, thiſtles, morgan, &c. it is good, if the ſummer prove cold and wet, to look over it a ſecond time, though you had weeded the wheat in the ſpring; for it is incredible how a ſecond crop of thoſe weeds will flouriſh in ſuch years, (though they were out of proof at the firſt early weeding) and keep on growing till harveſt, ſo as to burn the corn and eat out the heart of it.

Not to weed wheat near in ear. See §. 6. 12.

§. 10. My wheat was putting out into ear when I ſent weeders to weed it, but found at the day's end, that their ſtooping to pull up the may-weed and red-weed had bent many of the reeds under the ear, for the wheat was tall, and not likely to look up again, it being thick; therefore much of it was trodden down, or rather broke off near the root, the reed being grown ſtiff: I ſent my bailiff and others to view it, and they reported, that the weeders had done a great deal of injury to the corn.—So for the future I hope I ſhall be wiſer, and ſee my wheat weeded earlier: but, had my wheat been ſhorter and thinner, and a poor crop, it is probable to ſuch wheat very little damage might have been done: certainly it is beſt to weed wheat as early in the ſpring as the weeds are all come up, and, if it muſt be weeded a ſecond time, ten acres will be weeded in the time of one. I ſee quick-ſet plants and garden-ſtuff thrive ſo exceedingly the more for being weeded, that I cannot believe but that early weeding the corn will have the ſame good effect.

Not to weed immediately after rain.

§. 11. I aſked my bailiff, it having rained the day before, why he did not go to thiſtling my barley; he ſaid, by no means, he ſhould do more harm than good, whilſt the top of the earth was clammy; for it would clod to their ſhoes, and in treading on ſuch barley as was ſhallow-mored it would ſtick to their ſhoes, and they ſhould pull it up after them, as well as tread other ears into the ground which would never riſe again.

Of weeding early. See §. 6. 10.

§. 12. I began weeding my barley early this year (anno 1703) and my oats ſooner by a fortnight than others thought of it: I had about ten weeders in my corn, and yet found by the latter end of the weeding-ſeaſon, by the damage they began to do in treading down the corn, that I had great reaſon to rejoice for ſo doing: I had my weeders all ready againſt hay-making-time, which was then at hand: but when I had done weeding, the farmers had ſcarce begun, rain coming and preventing them, as they had miſſed making uſe of the ſeaſon when they might: he that thinks he ſhall have a good crop of any ſort of corn, had beſt weed it early, becauſe his corn, running thick and groſs, will receive the more damage by late weeding.

Weeds cut late, when groſs, and the barley groſs, it is likely the corn muſt have been much kept down by the weeds falling on it, ſo that it can never riſe again.

Of wild oats. §. 13. [a] Mr. Ray ſpeaks of wild oats as a weed difficult to be got rid of; for ripening before harveſt, and ſhedding it's ſeed in the ground, it will remain there till the ground be ploughed up again, though it be for a whole year, and then come up with the corn.

The Iſle of Wight is extremely apt to run to wild oats, which major Urry ſays, will lie four or five years in the ground, and come up when it is ploughed: his way to kill them is, to lay the ground down to clover, and to mow the oats and clover together before the oats are ripe, and then their roots will never grow again.

Of furze. §. 14. Mr. Cary's woodman walking with me upon Winterhay's farm in Dorſetſhire, I obſerved the grounds to be much over-run with furze; he ſaid, they were the worſt ſort of furze, they were French furze, which run up higher than the Engliſh furze does, but would not be ſo eaſily killed with chalk, nor were they tender enough for the cattle to eat them: they begin to blow in the middle of January, and laſt all the ſummer; the Engliſh furze begin to blow the latter part of the ſpring, and hold it all the ſummer.—I could ſee little difference between them, only the Engliſh was of a cloſer thicker prickle, and the ſmaller prickles tenderer.

Of fern. §. 15. Mr. Ray, ſpeaking of the fern, ſays, it is killed by cutting it two years together.

The deſtruction and killing of fern by cutting it ſeems to me to depend on the judicious time of doing it, viz. at the three proper ſeaſons, the ſpring, Midſummer, and Michaelmaſs, when and juſt after the reſpective buds are ſhot forth, to which nature has deſigned the current of the ſap, which, having no vent, muſt cauſe a plethory at the root and body of the plant, and turn to corruption; for the ſap muſt break all the capillaries, of which there are a multitude.

Of thiſtling. §. 16. Taking a view of my corn about three weeks after it had been thiſtled, I could not find that any of the ſtems of the thiſtles, which had been cut off, ſhot upwards ſince the thiſtling-hook had taken hold of them, nor did they anywiſe tillow out, or ſhoot up ſuckers; but I found three or four of the ſerpentine leaves to every thiſtle (which crept ſo low it was impoſſible the hook ſhould take hold of them) to have ſpread themſelves out pretty largely, yet not ſo conſiderably as might have been expected, the ſap feeding them plentifully; nor could I find the roots of thoſe thiſtles, which had been cut off, thrive beyond their fellows afterwards: it may be worth the inquiry whether thoſe lower creeping leaves would not riſe much higher, if one had patience to ſtay, ſo as the hook might cut below them: but the beſt way of all, both for diſpatch and profit, I conclude to be, to draw the thiſtle before it be grown to that bigneſs that they uſually cut them, and when the ground is reaſonably moiſt: when they are pretty big they will eaſily draw by the thumb and two fingers, but falſe fingers of hard leather may eaſily be had.

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[a] Inter ſegetes nimis frequens eſt, nec agri, qui ea ſemel infecti ſunt, facilè hâc peſte liberantur; etenim ante meſſem matureſcens, ſemen in terram effundit, quod per hyemem ibidem reptans, aut per integrum annum, ſi ſatio intermittatur, cum ſegete denuo ſuccreſcit. fo. 1254.

About a month after I had thiſtled oats and barley, I obſerved the barley-ground to be full of thiſtles again, whereof many ſtood ſo near to the old ſtems, viz. within ſix inches, that I ſuppoſed they had tillowed from them; therefore I dug down carefully half a foot in the ground, but could not find the roots of the young thiſtles inclined towards the old ſtem: I tore up the young thiſtles with roots of nine inches long, broken off and very taper and ſlender at bottom, with ſmall fibres belonging to them, as other maiden-thiſtles had: nor is it to be conceived that nature, which is ordered to go the neareſt way, ſhould from the ſlendereſt and loweſt part of the old root ſend forth it's ſucker, but from the upper part and ſtrongeſt of the whole root, neareſt to the ſurface; ſo I obſerved ſome ſmall tillows or iſſues from the old ſtem, which did not advance to any great height; they iſſued out between earth and air, and, as if maintained by the old ſtem, they carried a ſhrivelled dwarfiſh look with them: they iſſued out more freely and longer here than in the white ſoil though thiſtled a fortnight before this ground; for either the ſtems here carried no ſuckers, or very dwindling ones: therefore there is leſs danger of the thiſtles growing again by tillowing, in this thiſtling white land early than ſtiff clay: nor did the under-leaves of the old ſtems ſhoot out to any length in the white ground in compariſon to what they did in the clay: the wet year was the occaſion of theſe tillows.

Auguſt 24th (anno 1711) I dragged a nine-acre piece of wheat, ſowed on one earth, which was very thick, and full of thiſtles that had tillowed out from old ſtems, which I had cut about a month or ſix weeds before, leſt they ſhould run to ſeed; I was a little apprehenſive, though I knew the thiſtle to be but an annual plant, whether the tillowing thiſtles from the old roots might not ſtrike freſh roots to the great prejudice of my wheat; there were alſo many thiſtles which were ſeedlings.—November 17th I viſited my wheat, and though the forehand of the winter-ſeaſon had been very mild, yet I found all the thiſtles dead and rotten in the roots: it may be the drags battering them might haſten the effect, but I believe they had been dead ſome time before.

If wheat be not well thiſtled, the reapers take up the grips ſo tenderly, leſt they ſhould prick their hands, that by their looſe handling them many ears are left behind, and ſuch foul work is made, that the wheat left behind might ſow the ground.

Though barley and oats ſhould both be thiſtled, yet, if it is impracticable to accompliſh both, the oats ſhould be left unthiſtled rather than the barley, not only becauſe the oat-ſtraw is generally leſs proper for fodder than the barley-ſtraw, but alſo becauſe oats may lie longer in ſwarth and in cock than the barley, and ſo the thiſtles may have a reaſonable time for drying: it is further alſo to be noted in thiſtling ſpring-corn, that, if the thiſtles be

once

once grown tall, ſtrong, and prickly, as they commonly are before the barley be out in ear, and about five weeks before it is cut, then I think, though the barley be not ſo high, nor thick as to take harm in thiſtling by treading, yet the thiſtling in ſuch caſe does more harm than good; firſt, becauſe the thiſtles being grown ſo ſticky will not thoroughly wither, nor ſhrink and waſte away, as it were to nothing, by harveſt, but will be raked up with the corn; ſecondly, by harveſt ſuch great thiſtles will turn black, and ſpoil the fodder (being raked up with the ſwarths) a great deal more than if they had ſtood till harveſt; for then, being cut green with the corn, they will hold a good colour, and drying they will eat tolerably well, nor will the cattle refuſe them in the ſtraw. Chalking land is an excellent way to deſtroy the thiſtles.

It need not be wondered at, that in borders, alleys, graſs-plots, gravel-walks, &c. weeds, graſſes, and trumpery ſhould ſo increaſe as they do, if we obſerve that ſuch weeds and graſſes, however low they ſeem to be kept, run to ſeed when they are ſo ſmall as to eſcape our obſervation, and before they ſeem to be worth weeding up.

I was weeding my barley (anno 1701) ſo long before it was in ear that one could not know it from oats; the thiſtles were then pretty high and ſtrong; but a farmer in my neighbourhood ſaid, he never weeded ſo early, becauſe the thiſtles would grow up again.—Upon which, I talked with all the weeders, and with other huſbandmen, and I found by them plainly, that, notwithſtanding what the farmer had ſaid, it was good huſbandry to thiſtle as I did; for otherwiſe the thiſtles would grow ſo big as to eat up the heart of the corn, which it would not recover; and though the thiſtles might grow again, yet they would not feed nor be rank, but ſtill be over-topt and kept under by the corn; whereas by going into the corn when in ear damage was done, and then the thiſtles were ſo big, that being cut down they would fall on the barley, and ſink it down, ſo that it might ſome of it never riſe again, and that more eſpecially, if they cut down the thiſtles in rainy weather; for thereby they would be groſs and heavy, and not apt to wither ſo ſoon as otherwiſe they would do, and ſo the corn might be in danger of being ever held under: but when the corn was as young as mine, thiſtling when wet did it no harm: and, if by thiſtling ſo early you were forced to thiſtle again, it was no more than the beſt huſbandmen often do.

This day, being June 25th, (anno 1703) I conceived a fancy for reaſons before hinted at, that a better method might be found out for deſtroying of thiſtles than cutting them; ſo I went into a ground with a pair of tongs (which alſo might be improved) and with them I took hold of the lower ſtem of the thiſtle, and drew it up with all it's roots nine inches in length, the ſtems of the thiſtles being nine inches or a foot long, and that with greater expedition by much than the labourer could cut them, as he, being eye-witneſs of it, was ſatisfied. This inſtrument may not, it is poſſible, do ſo well in wheat, becauſe the ground may be too hard to draw the root; the practice

tice muſt only be in barley, where the ground is looſe: if the ground be ſomewhat moiſt, it will be the better.

It is good to thiſtle broad-clover, and to cut out the docks, and ſcabius's, &c. as well as corn, for thereby the broad-clover (I know it by experience) may be made a day the ſooner.

Of charlock, and how known from turnip.

§. 17. All this ſpring (anno 1708) being wet, and lands being generally obliged to be ſowed wet, it was obſerved there was an infinite quantity of charlock in cold red clays, both peas-land and barley-land; but in white or lighter land the charlock did not ſo much over-run it: therefore it ſeems one ſhould avoid ploughing and ſowing cold clays wet, if only on the account of charlock; the reaſon for this ſeems to be, becauſe charlock-ſeed is very oily and hot in taſte, as has been before noted, and therefore reſiſts putrefaction, and conſequently the fibres of the ſeed are not eaſily opened, and looſened, nor penetrated but by a great deal of moiſture; whereas white and light earth is ſoon dry after rain, and ſo the water does not continue long enough on it to ſet ſuch ſeed on growing: therefore cold wet lands are always more ſubject to charlock than white land.—In this the turnip-ſeed is of a direct contrary nature to charlock-ſeed, which latter to the taſte conveys in a very apparent manner a much tarter, ſtronger oil; for though the turnip-ſeed requires a ſpeedy ſhower of rain to bring it up, yet much rain, when it is firſt ſown makes it drunk, and it's parts being looſe and uncompact imbibe the rain ſo freely, that if they continue in it they are converted to mucilage: I have often ſowed charlock-ſeed and turnip-ſeed in flower-pots at the ſame time, and watered them, and found that whereas turnip-ſeed will ſhew itſelf in three days, charlock would not appear under ten days; the ſeed-leaves and roots of the laſt are much hotter and more peppery than the plant of turnip; therefore none who ſow turnip-ſeed need be at a loſs, on the firſt appearance of the plant, to know whether it be turnip or charlock; for, if the ſeed-leaves appear within a week's time, it cannot be charlock; again, if leaf or root taſtes hot, it cannot be turnip, which taſtes mild; the advantage of knowing which is, that one may loſe no opportunity to ſow turnip-ſeed again in a very few days, and conſequently loſe not the ſeaſon, if it comes not up, which by the aforeſaid ſigns one may know; whereas, if one muſt learn the difference from the leaves they put out after the ſeed-leaves, that muſt take up at leaſt three weeks, and thereby the ſeaſon of ſowing again may be loſt; for, if we have not ſhowers or moiſture for the ſowing of turnips, it will be to little purpoſe.

On obſervation paſt on my corn of all ſorts June 8th (anno 1715) my wheat, which was ſown on one earth, worked fine and pretty dry, i. e. a little drier than we commonly deſire it to do for wheat, and which was ſown pretty early, ran very much to charlock: I alſo obſerved that my blue peas which were ſowed in March, and the ground ploughed fine and dry, brought up abundance of charlock: whereas the wheat-ground which ploughed up as heavy, and wet, and cold as we commonly deſire it, and the grey partridge-peas, which were ſown from the beginning of February to the 20th, when the ground and the weather were colder, produced very little or no charlock: all this ſeems to depend on one and the ſame reaſon in relation to the ſowing, whether at ſpring or autumn; viz. the charlock-ſeed being cloſe in it's tubes and veſſels, and full of oily parts, which reſiſt putrefaction, as aforeſaid, the juices of the earth (whilſt cold and wet, and the ſeaſon ſo alſo) could not inſinuate into the charlock-ſeed, it not being attenuated enough by heat: whereas, when the ſeaſon of the autumn and ſpring, and the ground was warmer, and turned up fine, the juices eaſily penetrated the veſſels of the charlock-ſeed, and ſet them on growing; that afterwards, when both the weather, and the ground grew warmer, the charlock-ſeed did not grow up, is not to be wondered at, ſince the good diſpoſition of the bed ſeeds are at firſt committed to is of the greateſt moment, and the earth ſoon ſettles, and hardens, and falls cloſe, and becomes unfit to make the ſeeds grow.

This ſpring (anno 1701) I ſowed gore-vetches on a ſtale fallow of a head-land, and ſowed another piece of gore-vetches the ſame year on a ſecond ſtale earth of a month turned up; at the ſame time we gave a ſecond earth for barley; and I had nothing but charlock on the latter, and nothing but thiſtles came up in the former; from whence I collect, that harrowing on a ſtale ſpring-fallow tends to nothing but producing ſuch weeds the ground is inclined to: therefore I had better have given another earth upon the ſowing of my vetches, which would have buried the charlock that had took root, which the harrows alone could not do.

I winter-fallowed two grounds (anno 1702) when in very good temper and dry: the latter end of February or beginning of March I ploughed one again and ſowed it with peas, the ground working dry: I likewiſe ploughed the other again, and ſowed it to peas and gore-vetches at the ſame time; in both theſe grounds, and all over them came up abundance of charlock, ſo that they were perfect yellow with it; only about two acres of the latter was reſerved till the latter end of April, and then had a ſecond earth, and was ſown to more gore-vetches; but then rain had fallen and the ground worked pretty lumpiſh, and therein I had not a ſtem of charlock came up.

Id. and o thiſtles.

We had a very ſhowery wet ſpring all March, April, and May, and the firſt week of June, and my lands, being in very good tillage, worked exceeding fine at ſowing-time for peas, oats and barley, as alſo had my wheat-land and vetches, and I never knew fewer thiſtles in all ſorts of my corn, but there was abundance of charlock, which I have often obſerved to be the conſequence of land's working fine and dry. Charlock therefore is more the produce of poor ground, becauſe that generally works finer and drier than that which is ſtrong; but thiſtles are more commonly the produce of ſtrong land, becauſe that generally works colder, wetter, and rougher, which properties bring thiſtles; conſequently in thoſe years, wherein the ground works worſt, the thiſtles come up thickeſt. Perhaps the reaſon of this may be, becauſe the ſeed of the thiſtle may have taken root before the ſpring-corn is ſown, and, when the ground works rough, it may not be torn from many clods of earth, and ſo dies not, but abundance of the roots, having a faſtening to the earth, ſtill live; whereas, when the ground works fine, the roots of the young tender thiſtles may be torn away from the earth, and ſo wither and die; and that this may be the reaſon I am apter to believe, becauſe, when ground works rough, a crop of thiſtles ſoon appears, and tops the corn, which could not be, except the thiſtles had had ſome rooting before the ploughing for ſowing; for where the ground ploughs fine, as the thiſtles are few, the corn tops them, till it leans down it's head before the harveſt, and then the thiſtles, which were not weeded up, may ſhew their heads above the corn; and in this caſe the thiſtles are generally weak, as having no root but what might grow from the ſeed after the corn was ſown; for, as was ſaid before, where the ground works fine, what tender young thiſtles had taken root, which are the thiſtles ſuppoſed moſt to annoy corn, are, by the fine working of the ground, conceived to be torn up by the roots: thus the fine tillage of the ground prepares a bed for the ſeeds of weeds, but tears up root and branch thoſe weeds, which had before taken root, which, generally ſpeaking, are the moſt hurtful weeds; fine tillage of the ground therefore, in the general, is a quality of good huſbandry.

What may be the cauſe of producing charlock I cannot tell, but it ſeems, it muſt be either the ſowing ground early, or dry; for that part ſown late and wet had none: nor did my barley that year ſowed late and almoſt in the duſt, produce but very little charlock: but after ſowing the barley in April and May, there was no rain for a long time, yet the barley came up well, but the charlock came up very thin.—From hence I cannot but conclude, that, though a dry ſummer, and a dry winter-fallowing tends much to the killing of the weeds, which ariſe from roots or their fibres, as alſo from ſeeds, by laying open the ground to the froſts in winter, and to the ſcorching heat of the ſun in ſummer; yet that, when ſuch earth comes to be ſown either to winter or ſummer-corn, the finer and drier it works, and the better for bringing up the corn, the better and kindlier in proportion for the ſeeds of weeds, by reaſon the ſeeds of weeds are of leſs pith than the corn, conſequently more apt to be choaked when the ground works ſtiff: but when it works well for the corn, it does ſo alſo to bring up the weeds, which ariſe from ſeeds, or for the bringing up ſuch weeds as ariſe naturally from the ground, the body of the ground being more opened to the ſun and rain's viſiting all it's pores and impregnating it: for I cannot ſee why earth beſt prepared to bring up the ſeed-corn, is not alſo beſt prepared to bring up the ſeeds of weeds, and ſuch weeds as are natural to the ground. But the ſeaſonable winter and ſummer-fallowing, as before hinted, may reaſonably prevent and cut off ſuch weeds as ariſe from roots or ſeeds.—And as to ſuch weeds as ariſe by roots or fibres of roots, the drier and duſtier corn is laid into the ground, the more muſt ſuch roots be ſeparated from the earth, and be expoſed to wither by the heat of the ſun: but, as was ſaid before, I think it holds quite contrary in weeds ariſing from ſeed, and that the good diſpoſition and mellowneſs of the ground is fitteſt to produce weeds either from ſeed or naturally; the garden-mold being ſo fine, is for the ſame reaſon ſo ſubject to weeds. I ſee quickſet-plants and garden-ſtuff thrive ſo exceedingly the more for being weeded, that I cannot but believe early weeding the corn will do the ſame good to the ground; and this may appear from mellow earth flung up in digging a pond or other hole, which earth is generally of a mellow, hollow ſort, whereon thiſtles, and other weeds will grow abundantly, whether they come up naturally or by ſeeds ſown; this ſeems to ſhew how much fitter the better tempered mold is for weeds as well as for ſeed-corn: but when a mere and perfect ſtrong clay is flung out in a heap in digging ſuch a pond or hole as aforeſaid, then, as I have obſerved, ſuch mere clay has produced no weeds, the earth wanting that hollowneſs and fit mellowneſs, till by lying two or three years the upper cruſt is hollowed by the ſun, or by the treading both of men and cattle.

Of couch-graſs.

§. 18. Mr. Raymond ſays, the moſt deſtructive graſs to corn is the knot or couch-graſs, it being of that increaſing nature, that, if but a piece of a root were left, it would in one ſeaſon ſpread over a patch of ground as big as a ſmall caſting-net.

Of great and ſmall bindweed or withwind.

§. 19. Mr. Ray ſpeaking of great bindweed, ſays, it is frequent in hedges in watery places, it's root is perennial, but it's ſtalk annual: I ſuppoſe the ſmall bindweed is of the ſame nature, as to the ſoil it deſires, and the perennial root it carries; it grows in my clay-land, to the corn's great prejudice: therefore land may be preſumed cold that runs to it, and muſt be treated accordingly: I am apt to believe it propagates itſelf by feeding in paſture-ground, for it ſeems to flower too late, in corn, to feed before the corn is cut.

In both barley and wheat, in the deep rich land, near Ilſley, in Oxfordſhire, I obſerved, withwind with mighty groſsneſs climbed up moſt of the halm to the top, no doubt, but to the prejudice of the corn in many reſpects, which muſt be eat up before harveſt.

I have known withwind or bindweed multiplied and propagated both in barley and wheat, where the land has been ſtrong, and therefore more ſubject to that weed; for, when ſuch ground has been ploughed for ſome crops, to peas, barley, or oats, for which corn the land is only ploughed in the winter months, or for winter-vetches, for which end it is not tilled till about September, there is no killing thereby the roots or ſeeds of weeds as by ſummer-fallows for wheat, but the weeds, which multiply from the off-ſets or joints of roots, or from ſeeds, do increaſe thereby; in ſuch caſe I have known clay-land folded for barley (and particularly that part of the ground, which waiting for the folds going over at laſt was lateſt fallowed) bring up a great increaſe of withwind, though the ſpring and ſummer has been very dry, inſomuch that every blade of barley had a withwind round it; ſo that, as the fold has brought up a crop of barley, ſo it has, with it, to every blade of corn brought up it's enemy to eat it out, and pull it down before it is ripe, and prevent the filling of the grain, whereby the crop of barley is greatly hazarded after it is cut alſo, by the dange it muſt run by laying in ſwarth till that weed is withered, before it can be carted.—Again, near the end of the firſt ſummer, after the firſt year of a hop-clover crop, which I fed, that is, about the beginning of Auguſt, I fallowed a ground for wheat, and then dunged the fallows, and ſowed my wheat before Michaelmaſs: I had a very good crop of wheat, but a withwind came up to every blade, ſo that, had it been a wet and cold ſummer (whereas it was a hot and dry one) my wheat had been pulled down and lodged while green in ear, and in the milk, and then could not have filled in body and flour, and ſo had been of the nature of blighted corn: the increaſe of this withwind was, without doubt, occaſioned by the laying down this ground only to one ſummer-feed after the hop-clover was ſown, when the ground had born three or four crops of ſummer-corn after it's wheat crop, whereby, by the winter ploughings, as I intimated before, the off-ſets of the roots of weeds, and their ſeeds were propagated; and I could not properly by a ſeaſonable ſummer-fallow deſtroy theſe roots or ſeeds, by giving the ground a ſummer-fallow the beginning of June; for then I had loſt the fruits of my hop-clover crop by ploughing it in at the beginning of the firſt ſummer, which would have contributed much to the killing of the withwind; and by delaying the fallowing three months longer, viz. to the beginning of Auguſt, the ſun had both ſo loſt it's ſtrength to burn up the roots, and malt the ſeed, and the ground the opportunity of lying long to a fallow, that the dung laid on the fallows gave new life to the roots and ſeeds, which was very apparent by this one experiment: there had been a great deal of hop-clover ſeed ſhed that year, becauſe I could not feed the hop-clover down low enough (I had ſo great a burthen on the ground) and this ſhattered ſeed being on the beginning of Auguſt fallowed in, laid under the fallows alive till about the 10th of September, when I turned up the ground again for ſowing wheat; then the hop-clover ſeed was turned up again, and grew mightily by virtue of the dung, and at harveſt produced, with my wheat, ſo fine a crop of clover, that I thought it would better pay the feeding it a year, than to proceed on in the uſual courſe of huſbandry, viz. to winter-fallow after wheat, for peas, oats, &c.

Poppy or red-weed, and may-weed.

§. 20. Every one agrees the lighter one makes ground ſubject to red-weed, and may-weed, by giving it more earths, the more of thoſe weeds it will bring, and thoſe are ſome of the worſt weeds in corn; for I have known as good a crop of wheat as one would deſire all the winter-time, and by thoſe two weeds coming up in the ſpring and ſummer, it has been eaten out ſo, that there has not been the ſeed.

I find all agree, that in weeding the morgan or may-weed, and the red-weed, they ſhould be drawn up by the root rather than cut up with the hook; becauſe they have a ſlender tap-root, which draws eaſily, without looſening the ground, and mores of the corn, whereas, if they be cut, they will tillow and come again; but the thiſtle has too great a root to be drawn, and when cut comes not again.

Seeing poppy requires a winter and ſummer for growing, to make it's ſeeds grow, in order to fallow them up the ſummer after, and deſtroy them, it ſeems the ſummer-fallowing the year before, or the October before, is much conducing towards a wheaten crop.

The poppy is a winter and not a ſummer weed, the ſeed requiring to have root very early in the ſpring; therefore I never could obſerve it grow in barley or oats, unleſs it was barley and oats ſowed on one earth, which is very early ſown; the rooted ſeed, poſſibly, in ſuch caſe, being not pulled up by the harrows, grows, tho' in very little quantity.

It is uſually obſerved, that the white land in our hill-country is very ſubject to poppy, if ploughed with two or three earths, and made thereby light, but clay-lands are not ſo ſubject to be reduced:—the reaſon of which ſeems to be this; becauſe the poppy-ſeed is a moſt ſmall ſeed (for Mr. Ray computes many thouſands to lie in a pod) which ſeed, by reaſon of it's ſmallneſs, is eaſily buried in clay land, and leſs able to ſhoot it's ſeed-leaves through, becauſe it ſooner ſettles and binds than in light land, through which it's ſeed-leaves eaſily paſs: it is very likely therefore, the evil of red-weed being ſo great, it may be better to ſow white land on one earth.

The poppy is much hardier than the wheat, for that bloſſomed exceeding thick in the grounds where the wheat was almoſt all killed, expoſed to the cold winds of this winter 1709.

It is very plain that braiſhier ſhallower ground in the hill-country is very ſubject to red-weed or poppy, and the ſtrong clay-ground not ſo; therefore, wherever in a clayey piece of ground there is a ſinking or fall, or the grete runs ſhallower (as in ſome places of moſt of my clay-fields it does) as alſo in the lighter fields, there I ought to give the weeders ſtricter orders to be cautious and circumſpect to pull the poppy-weed up:—but, as to the ſtrong deep clay-land, even the poppy, though it does appear there thick, need not be much regarded; for it will there every day dwindle, and the cold clay will ſtarve it; whereas, on the contrary, what poppy appears in ſpring in the light ſhallow ſtone-braiſhey land, though the root and ſtalk ſeems poor, will ſpring forward, and thrive apace all the ſummer till it blows and ſeeds.

When the farmer ſays, red-weed, morgan, &c. burns up corn, it is only meant that, when that gets ahead, it ſucks up the moiſture from the corn, and then indeed it's lamentable effects are as if the corn was ſcorched up.

Cockle. §. 21. Being with farmer Lake of Faccomb, we fell into diſcourſe on huſbandry, and I told him I was gathering the cockle in the field out of the winter-vetches, leſt I ſhould bring them into the dung of the back-ſide: he ſaid, he ſaw not how that profited much, unleſs I deſigned them for ſeed, and then it might be inconvenient, but, if they were for horſes meat, if the cockle with the vetches came into the dung, it would be heated thereby, and never grow again; the ſame he ſaid of charlock: I aſked him then if he never thought abundance of trumpery was carried into the field with the dung, which grew again; he ſaid it was ſo in caſe green new dung was carried forth, but in caſe the dung was firſt flung up in heaps to rot, the ſeeds in it of weeds did not grow: he ſaid, if his ſeed-wheat was clean, he never obſerved he had cockle.

§. 22. Mr. Ray ſays of the corn-marygold, it has a woody root, and ſtrikes deep, therefore muſt eat out the heart of the ground, and muſt be a great harm to corn; if it's ſeed ploughed-in will grow, as the garden-marygold will being dug in, it is hard to overcome the increaſe of it. Corn-marygold.

§. 23. Farmer Biggs told me, that a field of his was all over-run with colts-foot, and that he ſowed it to vetches, and that thoſe vetches britted or ſcattered, ſo that he put in his pigs to fatting in it, which nuſsled about as much as they thought good, whereby, as he thinks, they trod and nuſsled in many of the vetches, for they came up very thick, and he preſerved them, and had a very good ſecond crop; which two years crop of vetches killed almoſt all the colts-foot, ſo that there has been but little there ſince. Colts-foot.

Colts-foot is ſeldom known to grow in the common arable fields, for the ſheep fare ſo hard there, that they eat up all the roots on the fallows, but, unleſs one was to bring ſuch ſheep on our fallows, they will not be eaten, for our ſheep will not deſtroy them.

The reaſon why laying a ground down long to graſs is ſaid to kill the colts-foot and other perennial weeds, is, I ſuppoſe, becauſe the roots of the natural graſs matting more and more every year, do in four or five years time ſo fill the ground and faſten it, that the colts-foot cannot come through at ſpring; they may alſo happily ſo bind the ſurface of the earth together, as to hinder the root from that communication with the air at other times as all plants may require; to haſten therefore the deſtruction of colts-foot, I apprehend that plat of the ground, where it abounds, ſhould be laid down to rye-graſs, to continue ſo till it is deſtroyed; though the other part of the ground be ſowed to clover, and ploughed up again, yet the colts-foot ſhould continue lay, and be dunged well, and mowed, and ſowed very thick to rye-graſs; theſe means may effectually deſtroy the colts-foot, as it is manifeſt dunging land does deſtroy clover and French-graſs.

I this day (July the 3d) ploughed up broad-clover, and turned up the roots of colts-foot. I obſerved between earth and air many little buds ſhot forth of the bigneſs of the Midſummer buds in fruit-trees (in all probability to be the enſuing leaves or flowers of the next year) from the root; at five, ſix, or ſeven inches depth I obſerved here and there a ſhoot, of a callous body, like the root, one, two, three, or four inches long. Whether the firſt or ſecond ſort of ſhoots were to be leaves or flowers of the next ſpring will be fit to be enquired into at ſpring, but what is to be obſerved, is, that in my fallow I turned up the colts-foot roots of a foot long; therefore in a winter-fallow I had undoubtedly turned up the ſame roots, at leaſt of the ſame length, and one would think to better effect, nature being to begin again all the progreſs ſhe had been going on till that time; but it is manifeſt a ſummer-fallow is of much greater conſequence to deſtroy the colts-foot, than a winter: how comes this then to paſs? the only reaſon I can give is, that the nature of colts-foot is to thrive and improve in cold wet ground; the winter-fallow therefore does not deſtroy theſe roots, which are ploughed up, but they live ſtill by reaſon of the coldneſs of the ground at that ſeaſon, and ſtrike freſh roots; whereas the colts-foot lies ſo dry in the ſummer-fallows, turned up to the ſun, as to die, nothing being more contrary to their nature than a healthy dry ſoil.—This ground being ploughed dry, and a rain following, whereby the ground was mellowed, I found theſe roots eaſy to be pulled up, at a conſiderable length, with their ſoboles or bud of the next year, above taken notice of; from which I do infer, that in hiring people to pull up ſuch colts-foot roots, if a remainder does break off, and is left behind, which may grow, yet for the next year it cannot, becauſe, the ſoboles being loſt, it is too late in the year to provide another; and though it may be thought that ſuch roots as are turned up in a ſummer-fallow, will wither of themſelves, yet it is to be conſidered, that ſuch ſoboles as are buried, if the ſeaſon be wet, will ſpring again.

Being at Oxford, I viſited Mr. Bobart of the phyſick-garden, and I told him of the method I took to deſtroy the colts-foot: he ſaid, if I cut the colts-foot often in a ſummer, or whipped it, it would, he believed, kill it; I ſaid I had ſo heard of fern; he agreed it to be true, and ſaid all plants were eaſily killed by keeping them under ground in that manner.

Ragwort.

§. 24. Common ragwort, Mr. Ray ſays, grows in paſtures and lay-grounds, and about path-ways the root dies; therefore it propagates by ſeed, and is to be extirpated before it ſeeds, by cutting it up.

Hoary perennial ragwort, Mr. Ray ſays, has a perennial root, and throws out new ſoboles, or buds, at autumn: if ſo, different methods are to be taken with it to extirpate it.

Nettle.

§. 25. Mr. Ray tells us, that the common ſtinging nettle is of a laſting nature,—but the leſſer ſtinging nettle is annual.

Dyer's-weed.

§. 26. Dyer's-weed makes the milk of the cows that feed on it bitter, as it alſo does the butter and cheeſe made of it.

Mullen.

§. 27. Ray and other herbaliſts ſay, that mullen grows on clifts and banks, and ſay nothing of it's growing in warm ſunny fields, which it does at Crux-Eaſton, particularly in one of my fields, where not above thirty roots of it came up in a ſcattering manner at firſt, which ſeeded, and the winds blew it about the ground, and the next year came up thouſands; but I obſerved thoſe that ſeeded the year before died, and therefore that it is a weed eaſily deſtroyed by cutting off the ſtem when it is in flower, and preventing it's increaſe by thouſands.

Groundſel good againſt the worms.

§. 28. Groundſel and ſavine are good againſt the worms, commonly called the bots in horſes.

Pilewort.

§. 29. In our meads at Eaſton, on our hills, and hedges, and lanes, we have great plenty of pilewort growing, which is an argument, that ſuch of our lands are moiſt and ſtrong where it grows.

Spurge.

§. 30. I find by Mr. Ray, fol. 868 and 869, that both the tithymalli or corn-ſpurges, which grow up in corn-fields, are but annual.

Spurry.

§. 31. In the common corn-fields, about Lutterworth, inclinable to a heavy fat ſand, I obſerved ſpurry to grow wild very plentifully; I gathered of it, and ſhewed it to Mr. Bobart of Oxford; we both wondered ſo contemptible a plant ſhould be ſown in the Low Countries, where Mr. Worlidge, fol. 31. ſays, they ſow it twice a year; once in May, to be in flower in June and July, and the ſecond time after rye-harveſt is in, to ſerve their cattle in November and December; he ſays, hens will eat the herb greedily, and it makes them lay eggs the faſter.

Knapweed, ſcabius, &c.

§. 32. The knapweed, or matfellon, is chiefly natural to corn-land, in a gravelly ſoil, and is of a perennial root, as Mr. Ray obſerves: devil's-bit is alſo perennial in it's root; it is probable blue-bottles are the ſame, and all of the ſcabius ſort, ſeeing they emit new ſoboles every ſummer at the root for the fruit of the next year, and ſeem not to ſeed early enough, before the corn is cut, to propagate themſelves in corn-lands by ſeed, in which ground they moſt abound.

It ſeems plain to me that both knapweed, ſcabius, and ſpatling-poppy roots are perennial, as alſo millefoyle (which infeſts ſome paſtures) by the many buds or ſoboles they emit at their roots at this time of year.

Yellow rattle graſs.

§. 33. It's ſeed ripens very ſoon, and as ſoon ſheds, after which it dies away root and all before hay-harveſt: the ready way to deſtroy it is to well-dung the meadows.

Eye bright.

§. 34. Eye-bright flouriſhes chiefly in upland barren paſture ground.

Lady's-finger.

§. 35. Mr. Ray ſays, lady's finger grows for the moſt part, in dry, chalky, or gravelly ſoils, and in all barren ground.

Yellow lady's bed-ſtraw.

§. 36. Yellow lady's bed-ſtraw, or cheeſerening, over-runs almoſt two of my meads, which have been mowed and not well ſupported with manure; but my other meads, parted only by a hedge, the ſoil and ſituation the ſame, being fed for two years have very little of it; it grows chiefly in warm places, and in dry paſtures, and on hillocks, and balks.—Therefore where this grows you may conclude your meadows want ſoil to fatten them.

Silver weed, or wild tanſey.

§. 37. Mr. Ray ſays, the root of wild-tanſey is good to eat, and ſomewhat of the parſnip kind, and that hogs are very fond of it.

Common chickweed.

§. 38. On the 23d of October I obſerved a great deal of chickweed, the branches of which carried many buds in order to bloſſom, many full bloſſoms, many ſeed-pods with white ſeeds almoſt ripe, and many pods with red ſeeds full and kindly ripe; ſo it ſeems it is in the nature of this plant to be always ſeeding, and ſo the leſs fence againſt it by any ſort of huſbandry.

Crow-foot, or ranunculus.

§. 39. There are ſeveral ranunculus's common in our meadows, which, when green, bliſter the fleſh; theſe are not touched by cattle, but left ſtanding in the fields, and yet, as I am told, are fed on greedily by all ſorts of cattle, when only dried into hay: Dr. Sloan mentions this to account for the caſſavis root, which, being ſtrong poiſon, by being baked is wholſome bread. fol. 25.

Red-rot, or flower-ſun-dew.

§. 40. Red-rot (or flower-ſun-dew) is ſaid to take the name of red-rot from it's being ſo pernicious to ſheep.

Ground-ivy.

§. 41. I obſerved abundance of ground-ivy trailing on the ground, and, in gathering it up, I found the trailing joints, being in abundance, had ſtruck freſh roots, from whence new leaves came up, as in ſtrawberries.

Mallows. §. 42. Mr. Biſſy of Wiltſhire had abundance of mallows that came up in a broad-clover ground, ſo as to overſhadow the broad-clover; he was ſatisfied mallow was in the clover-ſeed, becauſe his brother ſowed the ſame ſeed, and had the ſame increaſe of mallows; Biſſy ſays, every bit of the root of a mallow will grow. Note, this 23d of October I obſerved plentiful ſoboles or ſpring-iſſues from the old roots.

Fool's-parſley. §. 43. Cicutaria tenui folio, or fool's parſley, which grows in rich land, and in grounds that are cultivated, is an annual, and therefore may be deſtroyed before it has ſeeded.

Hare's-foot trefoil. §. 44. In Sheepſhead and Hawthorn-fields in Leiceſterſhire, I obſerved ſome ridges ſo peſtered with hares-foot trefoil growing amongſt the corn, that it ſeemed as bad a weed in the corn as any I had ſeen that year; both grounds ſeemed to be of a clayey ſand.

Cow-garlick. §. 45. Being at Mr. Raymond's, he aſſured me, that cow-garlick was a great whore in corn, a little way from his place in the dry ſandy grounds; and yet it is no whore to them who ſow it in the clays; for there it will not grow; but in his neighbourhood it comes up in the corn in great abundance; Stevens of Pomeroy ſays, it grows in ſome places in ſuch abundance, that the wheat taſtes ſtrong of it, and is thereby damaged 6d. and 12d. in the buſhel.

Moſs. §. 46. As rye-graſs and natural graſs eat out the clovers, ſo I obſerve in the third year of rye-graſs moſs begins to grow on the land, and eat out the rye-graſs and natural graſs, and is the great impoveriſher of meadows; it is very probable it's ſeeds are carried to far diſtant grounds, being ſo imperceptible (as Mr. Ray makes it) to the eye: it is very probable alſo, it, being ſo ſmall, is buried in arable, which may be the reaſon it comes not up but in land lying to reſt, where the ſeed cannot be covered or bound; it is poſſible alſo it comes not up in arable with the corn, becauſe (as many ſeeds do) it may not grow under two, three, or four years time; Mr. Ray obſerves, they are apt to grow either in too cold lands, or too ſcorched-up lands: he ſays, on houſe-tops they ſeldom increaſe on the ſouth ſide of the tiling, as on the eaſterly expoſition, and northerly, which the ſun goes off from by times, and on which the firſt dews of the night fall; from whence it may be concluded, land is ſo much the more or leſs liable to it as it faces thoſe expoſitions: but ſeeing it is ſo great an enemy to meadow, and other graſſes, the nature of it ought well to be obſerved, and it's ſeeds planted in pots to ſee their nature, that thereby one may know how to deſtroy it:—our experience ſeems to agree with what Mr. Ray ſays as to it's inclination to thrive in cold land, it being manifeſt that, when ſuch cold clay is rectified by aſhes or lime, or as he ſays, [b] aſhes of which lye has been made, which he adviſes to be laid on the ground in the month of March, the moſs forſakes the ground for ſome time.

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[b] Muſcus, qui hortos & prata humida obſidet, ita ut gramen ſupprimat, Martio menſe cinere aboletur, ſed eo quo lixivium fuerit confectum. Ray, Hiſt. Plant. fol. 122.

It is no ſuch great wonder that moſſes ſhould grow on ſtones and walls, if we conſider how many thouſand times leſs their ſeeds are than the ſeeds of moſt herbs, whereby they have as fit a matrix to cover themſelves in, in the crevices of the ſtones, where uſually duſt gathers, and are as well buried, in proportion to their bodies, as the ſeeds of other plants are in earth-mold; nor are we more to wonder, that the moſſes from the ſaid ſeed ſhould thrive and flouriſh as well as their ſeeds germinate, if we conſider how their bodies drink not only the dews, but are fitted, by the innumerable angles their branches and cloſe-knit fibres make, to be a long receptacle of water, and at the ſame time to break all the rays of the ſun, and how fit for gathering the duſt to their roots, as by experience may be ſeen.

Why dung and aſhes kill moſs.

§. 47. That dung, aſhes, &c. ſhould kill moſs, is, I ſuppoſe, from this reaſon; becauſe the moſs having a moſt wonderful ſmall root, which grows only to the ground by adheſion, is eaſily ſuffocated with too much goodneſs of the dung, and overcome by the ſtrong penetrating quality of the aſhes, as being no ways qualified by rain on the ſurface of the ground. For theſe reaſons the moſt diminutive plants will not grow on rich ground, ſuch as rue, whitlow-graſs, moſs, and a great many more, becauſe they, being very ſmall, and of ſlow growth, are eaſily overcharged with a plethory, from whence the fibres of the plant, nay even of it's very ſeeds whilſt in the ground, muſt burſt.

WATER and WATERING.

Of making a pond.

§. 1. IT is of but little purpoſe to depend on a pond's holding, becauſe it is dug in a ſtrong clay, if there be no great ſhade over it; for the ſun and froſt will quickly open it, and the water will run away; but ſuch pond muſt be made with four ſquare ſlopes, and covered with gravel, or a mortar-earth, four or five inches on the tops, which, cattle treading it in, will cement with the clay, and bind, and will not crack with the ſun and froſt; but nothing ſuffers more by either than mere clay.

Water proper for cattle.

§. 2. I begin to ſuſpect (in my hill-country-farm, where I have no ponds but what are pitched, and where I have my backſide-pond and the ſtreet-pond, which both muſt neceſſarily be ſometimes ſtained with dung) that, of your great cattle eſpecially, it is of conſequence to buy thoſe that have been bred in the hill-countries, where they have been uſed to want water more than they will with me, and have been uſed to drink our pond and ciſtern water; for I find cattle that have been uſed to ſpring or river water, do drink very ſparingly of our water; and then I am ſure they cannot thrive or fat well.

Foul water pernicious to cattle, &c.

§. 3. Foul water, as Grew obſerves, will breed the pip in hens, and naſtyneſs, lice and ſcabs in kine; and all creatures, ſwine themſelves, which love dirt, yet thrive beſt when kept clean.

Watering cattle.

§. 4. Farmer Elton, late of Crux-Eaſton, extolled the convenience of the pond I made in my field to a high degree; he ſaid, that by means of that pond I need not fear the drieſt year, for, if I had no graſs, and did put a hay-reek in the field, my ſheep would be all the ſummer mutton, when others would be carrion.

Farmer Collins (in the Iſle of Wight) was ſpeaking of the great neceſſity of having convenient water for cattle at all times, both for their health and increaſe of their milk, and how inſufficient it was for cattle to be drove to water but twice a day, whereas the cattle would poſſibly drink five times a day: and he ſaid, that hard weather came one winter when he had lambs, and was forced to fodder his ewes with hay, and the water where they drank was frozen hard over; three or four lambs of a day died away, and the ewes had not milk for them; at laſt he bethought him to break the ice of the pond, which when he had done the ſheep came to the water with great eagerneſs, and went in above their bellies and drank, and he had no more lambs died.

Water proper for watering plants.

§. 5. Worlidge, fo. 248. ſpeaking of different waters, ſays, it is a very great injury to moſt tender plants, to be diluted with cold water from the well or ſpring; it checks their growth exceedingly, as may be ſeen by a bleeding vine, to the naked roots of which if you pour ſtore of ſpring or cold water, it ſuddenly checks the aſcending of the ſap, by means whereof the bleeding ceaſes, and the wound conſolidates again, before the more liberal aſcent of the ſap: much more then will it check the growth of a weak herb or flower.

Rain and ſnow water.

§. 6. Rain-water ſeldom ſinks above a foot deep, but water of ſnow two or three foot deep, as being much heavier than rain-water; and as it melts ſlowly and by degrees, from the undermoſt part of the maſs of ſnow, ſo it ſoaks with more eaſe, not being hindered by the wind or ſun.—Therefore (ſays Monſieur de Quinteny) I dread much ſnow upon moiſt ſtrong grounds, and order it to be removed from about the fruit trees, ſo in dry earth I gather it as a magazine of moiſture to the ſouthern expoſitions. fo. 29.

Watering ſeeds.

§. 7. Worlidge, fo. 248. ſays, it is obſerved to be beſt to ſow in the duſts, whereby the ſeeds gradually ſwell, from the cold dews of the night and from the air, and are made ready to ſprout with the next rains.—So it is not good to water new-ſown ſeeds, till the long defect of ſhowers invite you to it; ſome ſeeds, as radiſh, lettuce, gilliflower-ſeeds, &c. remain not long in the earth, and therefore may in two or three days, for want of rain, be watered; but tulips, auricula, parſley, carrot-ſeed, &c. lie long in the ground, and require not ſo ſpeedy an irrigation.

Of watering plants.

§. 8. It is better to water a plant ſeldom and thoroughly, than often and ſlenderly, for ſhallow watering is but a deluſion to a plant, and provokes it to root ſhallower than it otherwiſe would, and ſo makes it more obnoxious to the extremity of the weather. Mortimer, fol. 455.

Of watering trees.

§. 9. The reaſon, I conceive, why plants or trees once begun to be watered in the heat of the ſummer muſt be continued on, otherwiſe it is worſe than if they had not been watered at all, is not becauſe a tree once watered needs it the rather, but becauſe watering in the heat of ſummer makes the ground ſubject to chop the more when dry, and therefore ſuch ground muſt be kept moiſt.

Mr. Bobart, of the phyſick-garden in Oxford, ſays, that it would be a very good way, in dry ſummers, (where water can be had) to water all ſorts of fruit-trees, for ſake of the fruit-buds and bearing ſhoots, and ſhoots of the wood for the following year, which are all formed in the Auguſt before; which do miſerably fail by reaſon of the drought.

I have heard it reported more than once, how conſtant and great burthens of fruit orchards have had, where the owners had power of throwing the water over them; of this it ſeems the antients, particularly Cato had a great opinion, when (in book 1ſt. de Re ruſtica) next to the vineyard, he gave the preference to hortus irriguus; it is no wonder if they ſoon found out the benefit of the command of water to trees in hot countries; it ſeems to be expreſſed by Cato, as if an orchard was no orchard without it; and though our clime ſtands not ſo abſolutely in need of watering, yet by this hint we may conclude how, in ſome hot ſummers, and dry grounds, an orchard is of little value without ſuch convenience.

§. 10. Want of rain at bloſſoming-time often makes the bloſſoms drop; by watering theſe trees have bore abundantly when none others did. Mortimer, fol. 529.

Of watering fruit-trees in bloom.

§. 11. This exceeding dry ſummer I obſerved apples were rather ſmaller than uſual, which Stevens of Pomeroy, my tenant, perceiving, and that his trees were well loaden, he in good time began watering his trees often, pouring down leiſurely two or three buckets full of water to each tree; which bounty his trees ſoon began to be ſenſible of; for whereas before, his and his neighbours leaves of their apple-trees were pale and ſhrivelled, his ſoon recovered a ſtrong deep colour, and he was very ſenſible his apples looked of a livelier fairer colour, and grew larger.

Of watering apples when the fruit is ſmall.

WORKMEN and WORK.

§. 1. TAKE care to man the hay-harveſt with enough people, for I find, by underſtanding farmers, that it helps to the diſpatch mightily, if it be any thing of a good hay-making day, to turn even the graſs ſwarths that ſame day.

Man well the harveſt.

The not well manning a harveſt, has either of theſe three effects, viz. that corn is over-ripe, or, being cut down, is not carried in without damage, or is cut down too ſoon, for fear leſt it ſhould all ripen together on you; the diſadvantages of the two firſt are very apparent; and for the diſadvantage of the latter, your corn ſhall yield two ſhillings in the quarter leſs than if it had been properly ripe; and two men extraordinary are many ways needed, both to carry on ſowing, dung-carting, thatching reeks, or odd neceſſary things.

Proper times for different works.

§. 2. Whereas men's hands are not only wanted in harveſt-time, but in ſeed-time alſo, therefore great care ought to be taken by forecaſting, to do all works before thoſe times, which otherwiſe muſt of neceſſity be done then; therefore let no thatching, carpentry work, mending of hedges, or other work, whereby the labourer may be called off, be delayed till then; which will not only put you in a hurry for want of men, ſome of whom may be ſuch indifferent workmen as you would not employ but on neceſſity, but hereby you are obliged to be often calling off the labourers from the works they ſhould ſtick cloſe to, whereby you cannot ſo eaſily take an account of their works.

Take care how you bring yourſelf under two dilemmas at the ſame time in your huſbandry: as for example, to be under equal inconveniencies if wood-carting is not performed to-morrow, and ploughing or ſowing, when you have but one team to ſupply theſe double duties: or again, to be obliged to keep folding your whole flock, becauſe you cannot otherwiſe manage the corn you have undertaken, when another way you ſuſtain as great a loſs by the not having the liberty of making the beſt of your lambs and old ſheep, by fatting them to a good advantage: if you run yourſelf into ſuch inconveniencies daily, it will daily take off a conſiderable part of your profits; and though you take the beſt care to free, and make yourſelf eaſy from ſuch incumbrances, the nature of huſbandry will unavoidably force ſuch difficulties too often upon you; for there are critical ſeaſons offering themſelves for ſome things to be done, in which one would be glad to have three times the number of men and horſes, that are requiſite in courſe, to carry on the buſineſs of the farm.

Leave nothing for winter that may be done in ſummer.

§. 3. Avoid all manner of winter work as much as poſſible (except the direct huſbandry of ploughing) all cartings wear out your plough-timber abundantly, foul and wear out your lanes, unleſs froſty; and ſo many lets happen by bad weather, that man and horſe often, for a long time, earn not half their pay: bring not yourſelf therefore under neceſſities of winter work, by picking up ſtones for highways, which you muſt be neceſſitated to remove becauſe of your ploughing up the ground; by leaving any ways undone in ſummer, that muſt be repaired in winter, one load of ſtones in ſummer going farther than two in winter, and then carting to that end hurts the ways as much as mends them: let your hedges, where damage may ariſe, be therefore well in repair before winter, that there be no works of neceſſity in wood-carting; let all carpenters work, bricklayers work, pitching or paving work, be foreſeen in ſummer, that by bad weather and ſhort days they may not loſe half their time in winter: bad wet weather in the winter is not fit for any ſort of carting, ſuch as wood, dung, chalk, &c. (but to plough white land in the hill-country, and in moderate froſts you ought to be fallowing) and if you leave ſuch work undone, depending on the winter, you will be at a much greater loſs to finiſh it, on account of unſeaſonable weather, than you will be at a loſs how to employ yourſelf in caſe the hardeſt ſnow and froſts come: for then there may be dung and chalk-carting, carting ſtones in heaps, which may be took up by the ſhovel: going to the beſt markets that are fartheſt; and no ingenious contriver, be the froſt never ſo long, can be at a loſs to invent work for that ſeaſon fully to employ him.

When workmen do leaſt work.

§. 4. The labourer's lazy time for work, when they want the maſter's eye moſt over them, is about three weeks or a month before harveſt, when work of all ſorts grows ſcarce, hay-making and faggoting, and dung-carting being over, and moſt other works out of ſeaſon; then they are apt to ſpin out their time, and linger it on to harveſt, that they may not want employ.

Of jobbs.

§. 5. I adviſe every farmer to employ a nimble, active, and free-labouring man, in ſuch buſineſs as conſiſts in jobbs and fractions, and employ the dull heavy man, if ſuch he employs, to ſingle works, ſuch as threſhing, &c. whereof an account can be kept; for a lazy lubbard will loſe half his time in the vacancies between one work and another, if you employ him in many in the day.

Of the FARM-YARD, &c.

Of a mud-wall.

§. 1. MR. Raymond adviſed me to fence about my backſide with a mud-wall; he ſaid, it was not only ornamental, but the cheapeſt and moſt ſerviceable of any; he gave but ſixpence per lugg or pole of a foot high, and two feet and half broad: but indeed, if he made it nine feet high, he gave five ſhillings and ſix pence for nine lugg of that height: he added, that in keeping my cattle warmer by ſuch a wall I might ſave half my fodder.

Of the ſtable.

§. 2. When I ſhewed ſeveral underſtanding farmers my ſtables that were building, and told them I propoſed but four horſes on a ſide, whereas in my farmer's ſtables they allowed ſix horſes to thoſe dimenſions, and would reaſon it to be ſufficient, by ſaying the horſes would not lie down all together, and it was ſufficient for their ſtanding; they all replied, they hoped I was wiſer than to regard them; that too narrow room might be the ſpoiling of a horſe, whoſe value might pay for the enlargement.

HOGS.

Marks of a good hog.

§. 1. THE marks of a good hog among the antients, according to Varro and Columella, were a ſmall head, ſhort legs, long bodies, large thighs and neck, and the briſtles on the laſt mentioned part thick ſet, erect, and ſtrong. In Wiltſhire they look on huge heavy lop-ears in a pig, as a very good ſign of his making a great hog.

Spayed and gelt ſhutes.

§. 2. I aſked Sir Ambroſe Phillipps's ſhepherd, whether the country people made any difference in the price between ſpayed and gelt ſhutes, provided, in other reſpects, they were equally good; he ſaid, they would not draw out the gelt ſhoots unleſs they had a better price, though he knew no other difference, but that the gelt pigs would be the maſters over the ſpayed, and ſo fare better, and conſequently thrive better.

Signs of an unthriving ſhute.

§. 3. A gentleman in my neighbourhood bought half a dozen young hog-ſhutes (of about nine ſhillings value); when they were bought I thought them big enough for the money, but did not like their ſhapes, being not long and ſtrait, but their rump bones riſing a little; but what was the worſt ſight and omen, theſe hogs, though of little bodies, had long hairs and briſtles: he kept them three months, gave them four buſhels of vetches, and very good keeping; then put them up for porkers, and gave each a ſack of peas, and would then be glad to ſell them for the prime coſt, and the price of the peas they had eat, ſo little did they thrive: the length of their hair I take to be an ill ſign, when their bodies are not proportionable, for it ſhews the hogs have had ſome check, which notwithſtanding hinders not the briſtles from growing, no more than ſickneſs does a man's hair or nails; and one had better buy hogs in a backſide than in a market; for one cannot ſee ſo well what is a proveable hog in a market as one can in the backſide, when he is among thoſe of the ſame litter, and the moſt proveable pig is cheapeſt, though deareſt at firſt coſt.

Of hogs degenerating.

§. 4. The breed of pigs I had of farmer Stephens of Pomeroy in Wilts, which were uſed there to whey and graſs, being removed to Crux-Eaſton, where their food was corn and waſh, did bring but three, four, or five pigs at a farrow, and ſo the deſcendants of them continued to do for three or four years, which I impute to their degeneracy, for want of the ſame food they and their parents had been uſed to.

Fruitfulneſs of hogs.

§. 5. [a] Varro ſays, we may judge of the fruitfulneſs of a ſow from her firſt litter; for ſhe generally brings about the ſame number ever afterwards.

Keeping ſows unprofitable.

§. 6. I kept four ſows, but ſoon grew weary of their farrows, for to a boy or other ſervant, that is to feed them, a great deal of corn is to be committed, both on account of the ſows and weaned pigs, and in the favour that muſt be uſed to them when they come to be ſhutes; if ſuch ſervant either gives them not enough, or your corn waſtingly, or neglects them ſome hours, either thro' idleneſs, or being otherways employed; in either of theſe ways, the profit of breeding theſe creatures is loſt; and if we make up the account how much corn the ſow eats us, the weaned pigs, and ſhutes, they eat out their heads; eſpecially conſidering, that in every year you keep your ſow you loſe twenty ſhillings, inaſmuch as a pig ought to pay ſo much, and, when you kill your ſow, the bacon is nothing near ſo good: I infer from hence, that it is no ways proper for a gentleman to be a breeder of pigs, or other young creatures, as poultry, calves, &c. any farther than a conveniency is to be regarded, but rather leave them to farmers wives, who can tend them themſelves punctually in all reſpects; nor can I apprehend the profit to be any thing to them, notwithſtanding their offal corn, which they might ſell: we ſay a ſow will undo a poor man, and we obſerve they never keep them notwithſtanding they may feed them with their own hand, and ſee nothing be loſt.

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[a] Sus ad fœturam quam ſit fœcunda animadvertunt ferè ex primo partu, quod non multum in reliquis mutat. Varro. fol. 56.

I find great inconveniency by having four ſows this year, not only on account that the greater pigs are the more neglected, ſuch attendance muſt be on the little pigs, but alſo on account of the harveſt coming on, againſt which time, and in which time, a boy's buſineſs ſhould be to give the birds diſturbance, and break them of their haunts, and drive the drove of pigs early into the field a leaſing, at which ſeaſon his time is loſt (which is too precious to fling away) in breakfaſting the little ones; beſides, at that time a ſpare hand is very uſeful, for an hour or two, in the garden, when no weeders can be had.

§. 7. They count in Wiltſhire, breeding of pigs not to make ſo quick a return as buying in of Welch pigs, and fatting them off with whey as faſt as they can: a pig bought in will in ſix weeks, or two months, be very good bacon, or pork, and pay at leaſt eighteen pence or two ſhillings per week. In Wiltſhire they order it ſo, that the ſows farrow not till May, becauſe their dairy comes not in till then; but he that intends to keep no cows, muſt order ſo that his ſows farrow ſix weeks before harveſt, that at harveſt the pigs may be able to go into the field. Of breeding hogs.

A certain dame was commending the breed ſhe had of ſows and pigs; I replied, I thought them to be the ſmalleſt ſort; ſhe ſaid, the farmer could not abide the great large ſort: I aſked her what was his fancy for that; ſhe ſaid, that the pigs, that were farrowed in March, of the greater ſort, would not make porkers in winter, for they would keep on growing ſtill inſtead of growing fat.

Beſides the trouble of breeding pigs, it is well to be conſidered, whether you can maintain the young ſhutes as well as the old ones between the leaſing of the harveſt and fatting, for, if not, you muſt be forced to threſh out barley the ſooner, when moſt likely it is the cheapeſt; nor likely is there more waſte corn in the field than the great hogs of a farmer can pick up.

§. 8. Sir Ambroſe Phillipps had a hog, which they thought to be gelt, and put him up to fatting, but he never fatted kindly, and, when they came to kill him, they found his ſtones in his back; his bacon ſhrunk and eat ſtrong: the ſhepherd ſays this is common to lambs, which when, at cutting-time, they find, they fat them up; it is common, he ſays, alſo to horſes. Of a boar with his ſtones in his back.

§. 9. They give the ſows in Leiceſterſhire, that they may take boar the ſooner, a good piece of leaven once in twenty-four hours, for two or three times: it is nothing but the green dough made as common leaven. To make a ſow go to boar.

§. 10. I was going to buy a ſow and pigs, and conſulted ſeveral perſons about the managing them, who acquainted me of theſe particulars, viz.—Firſt, That a young ſow, as this was but a year old, would bring but ſmall pigs.—Secondly, That being a young ſow, and having ſo many as nine pigs, it could not be expected any of them would be ſo properly fat for waſters, as if ſhe had brought but four or five.—Thirdly, That this ſow had come too early for moſt farmers keeping, though, if they had keeping for them, it was Of the ſow and pigs.

beſt of all, becauſe, if not ſtunted, they would be young bacon within the year.—Fourthly, That ſuch young pigs, and other lean pigs, ſhould not have their bellies full given them at firſt of ſweet whey, for by that means they often burſt their bellies.—Upon which I aſked a Wiltſhire dairy-woman about it, and ſhe ſaid, ſhe never knew them break their bellies; but one of our Hampſhire women replied, it was becauſe in their country they ſkimmed the cream off to make whey-butter, which took off from the luſciouſneſs.

[b] Varro's rule is to ſave as many pigs as the ſow has teats: if ſhe brings fewer, ſays he, ſhe is a bad breeder, and not profitable to keep, and if ſhe brings more, it is very extraordinary.

Of ſows eating their pigs.

If a ſow be high in caſe when ſhe farrows, I am informed, ſhe will be apt to eat her pigs. The firſt farrow of a ſow is accounted the worſt.

Bean-flour good for ſows with pigs.

§. 11. I told a notable dame in Wiltſhire, that I thought to give my ſow and pigs bean-flour, inſtead of barley-flour; ſhe ſaid bean-flour was beſt, and would breed moſt milk; but when ſhe gave them barley-flour, ſhe uſed to have ſome oats ground with it.

Whey good for pigs.

§. 12. Whey is more nouriſhing to pigs than ſkim-milk.

Of ringing.

§. 13. I had little pigs of about ſix weeks old newly weaned; my bailiff was of opinion they would turn up the meadows and corn-land, and dig worſe than older pigs (it was then juſt the opening of the ſtubble) he aſked me why I did not ring them, for by that means the ſow would not endure them to hang on her; for the pigs, though weaned, did run after the ſow and would be lugging her teats; he ſaid, it was a common thing to ring the pigs they deſigned to wean, in order the ſooner to wean them, for, being ringed, the ſow would be hurt by their ſucking, and ſo forſake them ſooner.

The ſmith came to ring my little pigs; I attended the operation; he ſaid he never ſpoiled a pig in his life, which put me upon aſking the queſtion, whether pigs were ever hurt by ringing; he replied, yes, often; for, ſaid he, if you run them through the griſtle of the ſnout, which lies on the bone and beneath the fleſhy part, the pigs noſes will often ſwell and rancle ſo as to kill them; therefore great care muſt be taken that the ring be only run thro' the fleſhy ridge of the ſnout: again, ſaid he, if the ring be twiſted too cloſe to the ſnout, ſo that it binds too hard, and cannot run round with eaſe to the pigs, their ſnouts will ſwell, in which caſe the rings muſt be taken off, and the ſnouts anointed to give them eaſe.

Ring not a ſow with pig, leſt in the diſpute ſhe caſt her pigs, nor endeavour to take an oat-hull out of a cow's eye forward in calf, leſt ſhe warps.

Of cutting and ſpaying.

§. 14. May the 17th, 1700, farmer Elton cut and ſpayed his pigs, which were ſixteen weeks old; the ſame day, by the ſame gelder, farmer Biggs, my neighbour, ſpayed his, which were ſix or ſeven weeks old: they did very well, and fell to their meat preſently; but farmer Elton's pitched, and would not come to their meat, nor eat of waſh, when they called them to it, till the fifth day, at which time they began to feed; the farmer thought he ſhould have loſt them; I aſked dame Biggs what ſhe thought could be the meaning that there ſhould be that difference between their pigs; ſhe ſaid, poſſibly farmer Elton's might be too hoggiſh and rank, and then they are apt to pitch; now I had obſerved, before they were cut, that they were apt to ride one another: upon this, I inquired of an underſtanding farmer, when he thought it was beſt to cut and ſpay pigs; he ſaid, the boar-pigs, the ſooner the better, if it was in a fortnight or ten days, as ſoon as their ſtones were come down; there was the leſs danger, and they would pitch the leſs upon it; nay, if a pig was cut in that time, deſigned for roaſting, it would be never the worſe: as to a ſow-pig, ſaid he, they cannot be ſpayed under five, ſix, or ſeven weeks old, and then is the time for it: in two or three days after this I came into Wiltſhire, and aſked farmer Pain the ſame queſtions, and he agreed to what the farmer laſt mentioned had ſaid.

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[b] Parcere tot oportet porcos, quot mammas habeat, ſi minus pariat, fructuariam idoneam non eſſe, ſi plures pariat, eſſe portentum. Varro, fol. 56.

I had little pigs cut and ſpayed the 3d of September; it was agreed, it was not fit to defer it, becauſe the weather would ſoon grow too cold, and, when they are cut or ſpayed, they muſt be kept moving and walking for three or four hours, leſt by lying down too ſoon they ſhould ſwell.

If pigs be cut (or eſpecially if ſpayed) they ought not to be ſuffered to creep through hedges, leſt the thread which ſows up the ſpaying hole, be drawn out, or the place bruiſed; nor ought they under a fortnight's time, in ſuch caſe, to be ringed, leſt they ſtruggle and hurt themſelves.

A ſow-gelder that had cut for me, cut four pigs for a neighbouring farmer, and the pigs happened to be broken-bellied, and they died on the ſpot, their guts coming out at their cods: I aſked whether it was uſual for pigs to be burſten-bellied; they ſaid, yes; and that, if they were cut young, they do often not perceive it, but if they did, they ſhould forbear to cut ſuch pigs, or, when cut, ſhould take great care to ſew up the ſkin.

If a boar-pig be cut or gelt, his tuſks do not grow, which ſeems to ſhew a ſtrange conſent of parts between the ſtones of a boar and his tuſks; and this ſeems to hold vice verſâ; for this month (September) I broke the tuſks of a large, fierce, and moſt venereous boar, which before was riding all the gelt and ſpayed pigs in the backſide, and would all the days and nights lie cloſe to the ſow that was brimming, having at that time ſeven ſows, and would go over walls and pales after them, five feet high, but when his tuſks were broke, he begun, from that time, to abate of his venery, and carried much leſs regard to them, and grew dull in his courage; I take the more notice of this[c], becauſe I obſerve the antients took the like notice of the relation between the cock's ſtones and his ſpurs..

[c] Of making capons (ſays Columella, lib. 4. cap. 1. fol. 185.) ſemimares, capi, qui hoc nomine vocantur, cum ſint caſtrati, libidinis abolendæ causâ, nec tamen id patiuntur amiſſis genitalibus, ſed ferro candente calcaribus inuſtis, quæ cum igneà vi conſumpta ſunt, facta ulcera, dum conſaneſcant, figulari cretâ linuntur.

They told me it was common among the pig-jobbers to put off a farrowing ſow for a ſpayed ſow, by cutting a ſlit in her ſide, and ſowing it up again; I aſked what that cheat availed the ſeller; they ſaid, ſuch a ſow was worth leſs by two ſhillings or half a crown than a ſpayed ſow, for there is hazard in ſpaying.

A ſow will not fat, unleſs ſpayed before put up to fatting, but will be continually riding the other hogs, and hinder them alſo from fatting; wherefore it is common to ſpay them a fortnight before.

It was July the 25th, and the ſow-gelder was with me to have ſpayed my ſows (for it ſeems that is a good time in order to their fatting before harveſt) but we thought them rank, that is, deſirous of the boar, and ſo we would not let him undertake it, for we look on it to be two to one but in ſuch caſe it will kill the ſows.

It is generally ſaid, that it is good to ſpay a ſow two or three days before her litter of pigs are weaned, becauſe, in caſe ſhe ſhould take harm, the pigs will draw off the venom; or, without being ſpayed, ſhe may be fatted at Michaelmaſs, becauſe being young with pig will not hurt her.

Of turnips for hogs.

§. 15. I was telling a perſon of great repute in huſbandry matters, that I could not make my pigs, in the winter, eat turnips, which was a great loſs to me; for I could not keep ſo good a winter ſtock as I otherwiſe ſhould, but he aſſured me, he kept, one winter, a great many pigs by turnips; he ſaid, he mixed ſome bran with them, and ſcalded the turnips, but, ſaid he, they will not eat the ſcalded turnips without bran.

Of grains.

§. 16. In managing hogs a gentleman has a good advantage above the farmer in this reſpect, inaſmuch as in March (when the corn is almoſt threſhed out) great ſtore of drink may be brewed, with the grains of which many pigs may be maintained till the middle of May, when the broad-clover comes in; and in October another great brewing may be had, to ſupply a great quantity more of grains, ſo as to maintain porkers (if pork in October and November ſells cheap) till December and January, when it is more likely to ſell dear, for pork at the forehand of the year, viz. September, October, and November, is moſt likely to be cheap, inaſmuch as the gleanings of the harveſt do raiſe the porkers to a great height, at which height they muſt be killed, becauſe they cannot be maintained at it.

Gore-vetches good for hogs.

§. 17. It is a common thing to ſow half an acre of gore-vetches for hogs, where farmers keep a great many, and they will eat them greedily, if the gore-vetches run groſs, and you give them to them when groſs, and before they are run far in flower.

Vetches too hot for hogs.

§. 18. In Wiltſhire they count vetches too hot a food to give pigs, which is apt to give them the meaſles; and therefore they mix other corn with them. Mr. Ray ſpeaking of the vetch ſays, fol. 900. they are uſed in England as food for horſes mixed with peas and oats, and adds, as peas are looſening, and of great virtues, ſo vetches are binding, and have no good virtues.

Broad-clover good for porkers.

§. 19. I find broad-clover not only excellent for keeping pigs to a height in

March and April, in which months the farmers corn is gone, and the dairy not come in, but alſo excellent for heightening up porker ſhutes, after the gleanings of the harveſt is over, all the months of September, October, and part of November, at which time pork is at the cheapeſt, becauſe the harveſt has fatted ſo many, which people muſt ſell, becauſe, after the gleanings are over, they cannot maintain them; whereas, by the help of this clover, with ſome little other helps, the porker ſhutes may be kept on longer.

Broad-clover ſwells young pigs.

§. 20. I aſked ſome farmers of experience, if pigs would not take the ſame damage by broad-clover as cows; they replied, that the full-grown pigs would thrive exceedingly with it, and be good pork, but that it would ſcour the young pigs, tho' of twelve, thirteen, or fourteen weeks old, and make them ſwell as big as two, but they never knew it kill them: on the whole it was agreed, that hogs will grow very fat by broad-clover, yet they never care that their young ſhutes and pigs ſhould eat much of it, for it not only ſwells them for the preſent, but makes them pot-bellied.

Henbane good for hogs

§. 21. Henbane is beneficial and nutritive to hogs (as Dr. Mead obſerves, in his Eſſays on poiſons) tho' it kills poultry.

Warm waſh in winter.

§. 22. If any perſon in the winter time keeps thirty or forty hogs, as I and many hill-country farmers do, I do adviſe, if they have the building of their own hog-houſes, wherein are their ciſterns for their hog-waſh (of which I have one holding about eight hogſheads) to ſet up a copper alſo and furnace therein, handy to put in the waſh, which may heat the waſh for the hogs in the winter; I find it to be very profitable.

Nuts bad for hogs.

§. 23. A butcher this day (September the 3d) wanted to buy ſome porkers and bacon hogs of me; my corn-erſh was juſt eaten up by them; ſo I told him I would gladly have parted with ſome of them, if I had not hoped they would take to the nuts, which were in abundance in my coppices; he replied, the nuts would hurt them; nuts would make their fat ſoft and greaſy, ſo that it would boil away, and nuts, being ſo ſweet, would make them ſo ſweet-mouthed, that the lean ones would not take to their waſh when the nutting-ſeaſon was over, nor thoſe, that are to be fatted, to their peas; and they would lie in the coppices whilſt any nuts laſted, though there were not a tenth part enough to maintain them, or to keep them from pitching: my cook ſaid, all this was true; ſhe knew it to be ſo by experience: I aſked her how ſhe knew this: ſhe ſaid ſhe had lived in families that had had experience of it, and had heard many ſay to the ſame effect: my woodman and other labourers do agree in it; but they add however, that, if ſuch bacon be put in the pot when boiling a gallop, it will make it boil firm.

Hemlock-root poiſons hogs.

§. 24. Farmer Collins of the Iſle of Wight aſſures me, that if the pigs meet with a piece of hemlock-root, in their digging up and down, be it never ſo little, they will be perfectly mad, and jump as high as an ordinary chimney-piece, and it is great odds but they die.

Not to let hogs lie in dung at night.

§. 25. Mr. Edwards chid his man for ſuffering his pigs to lie at night in the dung of the backſide, and for not accuſtoming to chace them to their ſtye:

I aſked him what was the reaſon for it; he ſaid, their lying in the dung was not accounted wholſome for them; for the heat of the dung made them ſo tender, that they would not endure the cold ſo well, nor thrive with their meat ſo well.

Of fatting hogs.

§. 26. Mr. Edwards, and my neighbouring farmer, and I, were diſcourſing upon hogs; Mr. Edwards ſaid, the farmer kept hogs in too good a condition before he put them up to fatting; the farmer replied, there would be the more lean, and therefore the bacon the better; for lean muſt be a long time making in a hog, and if a lean hog were ſoon fatted up, though you might raiſe him to what degree of fatneſs you pleaſed, yet ſuch fat would ſhrink and boil away: the farmer ſaid, the great cotſhill-pea is much the beſt pea for fatting hogs, and a quarter of them would go much farther than a quarter of the others, the which they would not ſwallow whole, as they would many of the partridge-peas. The underling hog put up with the reſt, is longeſt a fatting, being beat off by the reſt, ſo makes the fatteſt bacon; that bacon therefore they generally keep for beans.

At Newbury I met farmer White of Catmore; we talked of fatting pigs; I ſaid I believed beans to be as good to fat with as peas; he ſaid, he thought ſo too, and many perſons about him did fat with them; he thought change was very good, which kept them up to their ſtomachs, and ſaid, you muſt begin with beans, for after peas he thought they would not eat beans, peas being the ſweeter food; he and farmer Stockwell did both ſeem to agree (that in reaſon, though they never tried it) the flour of beans or peas would fat better than the whole grain.

I find farmer Farthing, and my tenant farmer Wey of the Iſle of Wight, without regard to the price of peas, be they cheaper or dearer, do ſtill fat with ground-oats, and barley, and do allow a buſhel of barley to a ſack of oats; they ſay, the reaſon for allowing barley to the oats is to make them both grind, for otherwiſe, I conceive, the mill could not be ſet fine enough to grind the oats by themſelves; they aſſure me, the hogs will fat thus much ſooner than with peas, but, I ſuppoſe, if peas could be ground, it would alter the caſe, for hogs ſeem very voracious of peas, and to chuſe the pea-ſtubble beyond any other; they fling alſo into the trough, when they feed them, if there be many of them, a handful of bay-ſalt, but if that be not to be had, other ſalt, which makes them drink very much, and contributes to their quicker fatting.

In diſcourſe with farmer Briſtow, I obſerved, that the ſmaller peas were ſweeteſt, and diſcernable ſo to our taſte, and the ſmall grey partridge particularly ſweeter than the great partridge, and therefore, tho' the great partridge was always deareſt, yet the leſſer would fat a hog ſooner. He ſaid, his father, who lived near Reading, and the farmers thereabouts, gave their hogs the white boiling pea, and that they fatted much ſooner; I anſwered, undoubtedly the blue pea (which of all field-peas is the ſweeteſt) would for the ſame reaſon fat hogs ſooneſt; he replied, no; for he could aſſure me, that about Reading they had tried them, and had found they made the hogs ſcour; therefore it ſeems they are too luſcious and cloying.

Farmer William Sartain of Wilts came to ſee me at Eaſton, June the 8th, and I carried him into my corn, and ſhewed him ſeveral ſorts of peas I had ſowed, viz. great grey-partridge, or Windſor-greys, burbage-popling, and blue peas; the farmer aſſured me, that though blue peas, if they boiled well, would ſell for moſt on that account, yet the grey-partridge would fat hogs better than the burbage-popling, or blue pea, as he had obſerved on experience; and he ſaid alſo, that, though the popling and blue pea ſeemed ſweeter, yet the hogs would prefer the great partridge to them, as he had often experimented, by laying all three ſorts in diſtinct troughs before them.

Mr. Smith of Stanton, a very experienced farmer, aſſures me, that the beſt way of fatting hogs is thus; viz. to give them, when they are firſt put up, rough corn, or peas wads, that they may work upon the halm, which when they have done for two or three days, then he gives them threſhed peas in troughs, and alſo a ſervice, once or twice a day, of waſh; and this he continues to do for two or three days, and then he plies them, in the uſual way, with peas altogether and water; by this means they are not at firſt glutted and ſurfeited, but kept to a coming ſtomach, and are by degrees initiated to a full diet.—However, it is agreed that hogs ſhould be well ſwilled with waſh before they are put up for fatting, otherwiſe they will make themſelves ſick for two or three days.

I obſerved two pigs, after they had been about three weeks in fatting, to look very lank in the flank; notwithſtanding this it was agreed they were very fat; and that pigs would bluff and ſwell much with their feeding the firſt ſix or ſeven days, and look fatter to the eye than afterwards; for, when they gather fat inwardly in their bellies, the weight of it draws down their bellies, and makes them look thinner and lanker.

Of fatting a boar.

§. 27. A boar is fit to be killed when leſs fat than a hog; for all the ſoft fat between the fleſh and horn will be, for the moſt part, boiled away, therefore to no purpoſe to make it very fat.

If any gentleman keeps a boar for fatting, I adviſe him to be provided with another young boar to brim the ſows, againſt the time he puts up the old one to fatting; for by experience I find, that, though the fatting-boar be penned up at ſome diſtance from the backſide, and out of the road of the hogs, and hedged out from them, yet the brimming ſows will rig over or under hedges to him, or labour ſo long at the gates till they ſhall open them, and, if they once get to the outſide only of his pen, it does the boar more harm than a fornight's meat will do him good.

Of a gelt hog and a ſow.

§. 28. Mr. Edwards and others I find do agree, that a gelt hog fattens moſt in the back, and a ſow in the belly.

Not to ſend fat pigs a leaſing.

§. 29. About Holt in Wiltſhire, the farmers never uſed to turn their forwardeſt pigs into the corn-fields, for they, that were near half fat with whey, would never go a leaſing to any purpoſe, but would either come home again, or lie down under the hedges, ſo that they would come home worſe than they went out; therefore they uſually buy lean pigs againſt ſuch time.

Clean ſtraw for hogs in fatting.

§. 30. Of hogs, ſays the Maiſon ruſtique, freſh ſtraw often given them doth fat them as much as their meat, and you muſt take care their troughs be always clean, fol. 147. Special care muſt be taken that their meat be not cold, nor too thin, leſt it cauſe them the flux in their bellies. [c] Columella has the like obſervation in regard to keeping them clean.

Of acorns.

§. 31. In an acorn year the hogs will not thrive proportionably on the maſt, at the firſt part of the ſeaſon, as they will after wet has fallen, to make the acorns * chiſſum, for then they are far more nouriſhing.—They are apt to ſcour hogs, when eat new from the tree, and are not then ſo good, as when they have laid in heaps to ſweat.

* Grow.

Signs of a ſick hog.

§. 32. A ſign to know if a hog be ſick, is, when he hangeth his ears very much, and for your better certainty thereof, pull from him, againſt the hair, a handful of briſtles off his back, if they be clean and white at the root, he is ſound and healthful, but, if they be bloody or otherwiſe ſpotted, he is ſick. Maiſon ruſtique, fol. 149.

Of the meazles.

§. 33. The ſigns of a meazled hog are blackiſh puſtules under his tongue, and if he cannot carry himſelf upright on his hinder legs, and if his briſtles are bloody at the roots. Maiſon ruſtique. — [d] Alſo Florentinus in Geoponicis. — [e] Didymus tells us that Democritus preſcribed for this diſtemper in hogs, bruiſed aſphodel roots to be given to them mixed in their food, and ſays it will cure them in leſs than ſeven days.

Of the fever.

§. 34. If a pig is hot in his body, which is to be known from the drineſs of his dung; two ſpoonfuls of ſallad oil in a pint of warm milk, ſuch as comes from the cow, will cleanſe him, and bring him to his ſtomach again. [f] Didymus preſcribes bleeding in the tail.

Of the murrain.

§. 35. Mr. and Mrs. Edwards ſay, the murrain in pigs (for as much as they can obſerve, and as their doctor for drenching tells them) proceeds from their being in too great proof, and caſe; many hold that muſty corn will give them the murrain; as ſoon as they obſerve it in one, they drench all the reſt.

It was the 25th of Auguſt I had a hog died of the murrain, and many hogs did die about the country; I had ſome powders to give them in their waſh of grains, which I could not get them to eat of, it being ſtubble-time; my bailiff ſaid, he could not ever, in the the like caſe, get them to eat of grains, but the way was to give them it in ſkim-milk, and then they would eat it.

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[c] Quamvis prædictum animal in pabulationem ſpurcitie verſentur, mundiſſimum tamen cubile deſiderat. Columella, lib. 7. fol. 181.

[d] Qui ipſos emunt ex pilis de jubâ evulſis ſanitatis ipſorum notas ſumunt; ſi enim fuerint cruentati, morbum indicere aiunt, puros contrarium. Florentinus in Geop. fol. 468.

[e] In quem caſum Democritus phyſicus aſphodeli radicis modicè tuſæ minas tres cibo ſingulorum ſuum admiſcere jubet, & ante ſeptimum diem integram ſanitatem inde recuperaturos teſtatur. Didymus. fol. 470.

[f] Si febricitent, ſanguis è caudâ emittendus. Didymus, ib.

This (1705) was a wonderful dry ſummer, in which for three weeks we fetched water for our cattle; about the latter end of October I had a ſow with pigs fell ill, and in a day or two after a fatting hog fell ill, and died; we ſent to the hog-doctor to drench all the hogs, who ſaid, Mr. Whiſtler had loſt ſix, and that they died in many places, and the cauſe of the murrain was the mighty dry ſummer, whereby the hogs had not water in plenty to drink, nor mire to roll themſelves in: therefore after ſuch dry ſummers drench hogs by way of precaution.

Of the leproſy.

§. 36. Mr. Boyle, in his Advantages of experimental philoſophy, recommends antimony to cure the leproſy in ſwine, it being a great ſweetener of the blood, and ſays alſo, it is very good to cure the worms in horſes.

Of bleeding in the tail.

§. 37. A noted pig-doctor in Hampſhire adviſes me, if ever I bleed a pig in the tail, to cut off his tail above the hocks, and rub it firſt, it will bleed the better: pigs by having too litle of their tail cut off, eſpecially in the ſummer, when troubled with flies, will be knocking it about their hocks, and keep it bleeding ſo as to bleed to death. Note, he ſays, the long-legged hogs, as it were double-jointed at the knee, are of a breed ſubject to the ſtaggers.

Young pigs not profitable for bacon.

§. 38. We had a young pig of three quarters old; we killed it for bacon; the farmer ſaid, though I gave ſix ſhillings per ſcore, the pig eat him as much peas as he was worth, for, ſaid he, a young pig, though he makes the beſt bacon, yet fats not ſo faſt as a pig of full growth, for his food runs into growth.

Of ſwilling a hog.

§. 39. I bought a hog, and when it was ſwilled, the farmer commended very much the ſwilling of it, becauſe it was in no place burnt; whereupon I aſked him if it was uſual to have them burnt; he ſaid, where the hog was dirty there would be danger of it's burning, which in that place ſpoiled the bacon.

The chief or only damage of burning a hog in ſwilling is, that the bacon will be apt to ruſt there.

Care muſt be taken, after hogs are ſwilled, that they be not bruiſed.

Of ſalt and ſalting.

§. 40. Remember to provide a ſtock of ſalt in the moſt dry ſeaſon of the ſummer, becauſe it will come dry to you, and is at ſuch times always cheapeſt; for the ſalternes at ſuch times, being able to make a greater quantity of ſalt than they have ſtowage for, ſell it the cheaper.

Of drying bacon.

§. 41. A hot fire in a chimney, which heats the bacon, and then letting that chimney be without fire again, makes the coat of ſuch bacon ſlack, and brings a ruſt into it.

POULTRY.

Number of hens to a cock.

§. 1. COLUMELLA, ſpeaking of cocks, ſays, one cock is ſufficient to five hens.

Hemp-ſeed makes hens lay.

§. 2. Mr. Ray ſays, hemp-ſeed is looked on to make hens lay, even in winter, but to incline them to ſo much fat as to prevent their kindly laying after; it is pernicious to be given to ſinging birds alone, without other ſeeds; it either kills them with fat, or makes them dull in ſinging.—[a] The antients were of opinion that the leaves of cytiſus made hens lay. As to the age, when hens are in greateſt perfection for laying eggs, they preferred thoſe of two years old.

Of eggs.

§. 3. In purſuance of what I have remarked before in regard to the punctum ſaliens in ſeeds, viz. that it is anſwerable to the ſanguinea gutta in an egg, and like that is a vital principle, which has action antecedent to bare rules of matter, and is owing purely to the will of God, ſuitable to Moſes in Geneſis, I do conceive farther, that the punctum ſaliens in a ſeed, as alſo the ſanguinea gutta in an egg, have each alike their ſiſtole and diaſtole, that is, an opening and ſhutting in a ſpringy manner, and that, if the egg is heated, or under incubation, the yelk being immediately attenuated by heat, does inſinuate ſome of it's parts into the opening of the heart or ſanguinea gutta of the egg, which in it's reciprocal ſhutting motion ſqueezes the juices into the paſſages and firſt lines already formed, although wonderfully ſhort and fine, which are the main branches of the bird; thus they are lengthened and thickened by each opening and ſhutting, till the whole yelk is abſorbed; thus the flour alſo in the ſeed is attenuated by moiſture and heat, till at length it is quite ſwallowed by the punctum ſaliens, which like an engine caſts it into the veſſels of the plant: theſe are the firſt food both of plant and animal.

Columella lays it down as a rule, that eggs ought to be ſet at ten days old, whereas in England they may be ſet well at thirty; the reaſon is, becauſe the heat of the air in Italy is ſtrong enough to act ſo on the ſanguinea gutta as to lengthen the fibres ſo far, and to make ſuch progreſs towards the growth of a chicken, that the circulation to the extremity of theſe fibres cannot be maintained, and conſequently not the nouriſhment of the chicken without a greater heat, for want of which there is a failure, if not committed to incubation; but the air of our clime works ſo ſlowly, that it ſcarce forwards it.

I aſked a notable dame whether it was true, that if a hen was kept too fat ſhe would lay an egg without a ſhell, and a leſſer egg; ſhe ſaid it was true: I aſked whether ſhe had a hen ſometimes crow-trodden; ſhe ſaid, her people would ſay ſo ſometimes, and ſuch hen's feathers would ſtare; it fell commonly on a hen that was black, but Mrs. Edwards affirmed, ſhe had known it befall other hens too; they ſaid it was incurable. I the rather mention this, becauſe Mr. Markham affirms it in his book of huſbandry, in his chapter of Poultry.

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[a] Cytiſi folia viridia ipſas fœcundiſſimas faciunt. Aptè ætate ad parienda ova ſunt anniculæ, maximè vero biennes, minus his valent ſeniores. Florent. in Geop. ſol. 379.

[b] Eggs that are new laid may be known by their roughneſs and whiteneſs, and, if you hold them up to the ſun, you will find a tranſparency in them, which is not in eggs that have been ſat on two or three days. If they are ſat on, Florentinus cautions us not to ſhake them for fear of deſtroying their vital principle. Varro ſays the ſame, and adds, that addled eggs will ſwim in water, and good ones will not.

Of ſetting hens.

§. 4. [c] The antients, in many parts of huſbandry, had a very great opinion of the influence of the moon, and accordingly in ſetting hens, Columella directs it ſhould be done from the tenth to the fifteenth day of the moon's increaſe; which is not only of advantage, ſays he, to the increaſe of the chickens in the eggs, but by this means it will ſo fall out, that the chickens will be hatched alſo when the moon is increaſing, which will be a great benefit to them.

When a hen is ready to ſit it may be found by the feathering her neſt, for ſhe then begins to pull off the feathers from her breaſt, and to make her bed; and before ſhe is ready to ſit, if you would have her ſit in the place you deſire, it is good to confine her to that place before ſhe has laid all her eggs, that by laying an egg or two there, ſhe may be reconciled to it; for, if her laying be out, and ſhe has choſen another place, it will be hard to get her to ſit to what place you deſire; and it is better to let her ſit in the worſt of places ſhe ſhall chooſe, than to remove her from the place ſhe has once choſen. Columella directs to increaſe the number of eggs you put under hens as the weather grows warmer. fol. 187.

I find Pliny, Varro, &c. order, that the number of eggs you ſet under hens ſhould be odd, without aſſigning the reaſon for it; but Markham, fol. 112. ſays, the eggs will lie the rounder, cloſer, and in evener proportion together.

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[b] Dignoſcantur ova, an quod in ipſis eſt fœcundum habeant, ſi poſt quartum diem incubationis ad ſolis radium contempleris; ſi enim quid fibratum tranſiens apparuerit, & ſubcruentum ſit, quod ineſt fœcundum erit; ſi vero pellucidum erit, ceu ſterile ejiciatur. Sed experimenti ſumendi gratiâ, ova non ſunt concutienda, ne quod in ipſis vitale eſt corrumpatur. Floren. in Geopon. fol. 379, 380, &c.—Ova plena ſint atque utilia necne animadverti aiunt poſſe, ſi demiſeris in aquam, quod inane natat, plenum deſidit.

Ova ſi incubantur, ſi habent in ſe ſemen pulli; curator quatriduo poſtquam incubari cœperint, intelligere poteſt; ſi contra lumen tenuit & purum uniuſmodi eſſe animadvertit, putant ejiciendum, & aliud ſubjiciendum. Varro, lib. 3. fol. 72.

As our author has given no directions for preſerving eggs, the following ſhort note may perhaps not be impertinent. Some dip them in hot fat, which, if care be taken that they are not overheated by it, may be a good way; but as eaſy and cleanly a method as any, and I believe the ſafeſt, is, to beat up the whites of eggs to an oil, and then to ſmear over the eggs you intend to preſerve with a camel's hair bruſh dipped in this liquor. Take care that they are entirely covered with this varniſh, and I am credibly informed it will keep them freſh above a twelvemonth.

[c] Semper autem, cum ſupponuntur ova, conſiderari debet ut luna creſcente à decima uſque ad quintam decimam id fiat; nam & ipſa ſuppoſitio per hos fere dies eſt commodiſſima, & ſic adminiſtrandum eſt, ut rurſus cum excluduntur pulli, luna creſcat, diebus quibus animantur ova, & in ſpeciem volucram confirmantur. Columella, lib. 8. fol. 188.

Of ſetting geeſe and turkeys. See §. 13.

§. 5. Many of our turkey-eggs and gooſe-eggs proved addled this year (1706) ſo that we had very ill-luck in hatching our feathered fowl; a maid, who came juſt after our ill luck, ſaid the reaſon muſt be, becauſe we ſtill took away the eggs from the hens as ſoon as they layed them, whereas, if their eggs had been left, their deſire of ſitting had increaſed, and they would have ſat ſooner; therefore her miſtreſs did let the eggs alone: note, it will be good therefore to pen up the hens ſoon after their laying is over, and make their neſts and put eggs into them.

Of breeding chickens.

§. 6. Chickens do better, and thrive much the faſter for running about with the hen, not being cooped up; for the hen, having her liberty, ſcratches up emmets, bugs, and worms, more agreeable food than we can give them; but the hen, having been cooped up, is very wild when ſet free, and rambles at a ſtrange rate, to the loſs of her chickens, nor makes ſhe, when ſet free, a tender mother.

Of rearing chickens in winter.

§. 7. The princeſs's poulterer aſſured me, that rearing early chickens by a kitchen-fire, as poor people did, was by no means a good way, for it was not a natural warmth to them, and their fleſh would not eat well; that ſtraw and the warmth of the hen, but eſpecially good meat in their bellies, was the beſt means to ſupport them in cold weather: for outward warmth ſignifies nothing, if there be not a good vital ſubſtance; and, ſaid he, in feeding little turkeys and chickens, you will find by experience they will feed better and thrive faſter by pecking off of your finger than from the ground; barley-meal is the heartieſt and beſt food for them, and cheeſe-curd a very hard food, that nouriſhes not nor heartens, and therefore it is a great miſtake in houſewives, who give it.

Vetches not good for chickens.

§. 8. Farmers agree, that at the time of threſhing their vetches, it is common to have the chickens, almoſt as big as the old ones, die, being not able to digeſt the vetches, which ſwell in their crops; and even the biggeſt poultry will be ſick with it.

Of a pullet with egg.

§. 9. A pullet with egg is accounted very good meat, but then I conceive it is about the beginning of February, when they are but young with egg; for on their firſt being with young all creatures thrive, but the embryo growing big it preys on the mother, and draws the moiſture and nouriſhment from her, which is the caſe of the pullets at this time of the year, viz. the beginning of March.

Of geeſe.

§. 10. Mr. Cowſlade of Woodhay tells me, notwithſtanding the objection to geeſe on their tainting the graſs, they are a great good to cattle, where lands are ſubject to murrain; he ſays the common of Emburn is the ſame ſort of land as that of Woodhay, but in the court-leet at Emburn, ſuch are preſented as put geeſe in the common; yet Woodhay people take the liberty, and it is obſerved, where one beaſt dies of the murrain at Woodhay, ten die of it at Emburn. Salmon's Diſpenſatory ſays, gooſe-dung is excellent againſt the green-ſickneſs, ſcurvy, jaundice, dropſy, and gout.

Pliny ſays of the gooſe, they tread in the water, and Worlidge ſays, it is obſerved of geeſe, that in caſe the waters are frozen up (as in ſome hard winter winters they are) about their treading-time, then the moſt part of their eggs will prove addled; the reaſon is ſaid to be, becauſe the gooſe proves more fruitful when ſhe is trod by the gander in the water than if upon the land. fol. 175. Quære how it fares with thoſe, who keep geeſe where no water is, or where the ponds prove dry in treading-time.

Young geeſe will never fat well when they are breeding their young feathers, for their feathers take off from their nouriſhment.

Three geeſe to a gander.

§. 11. Of geeſe, Columella ſays, you ſhould allow a gander to three geeſe; for they are too heavy to ſerve more [e].

Old geeſe breed earlieſt.

§. 12. The older the geeſe, the ſooner they lay, for which reaſon an old gooſe is more profitable in bringing earlier goſlings, which yield the more money. Some ſay, if the gooſe be two years old it is as well as if more, but ducks will breed as well at one year old.

Of ſetting geeſe. See §. 5.

§. 13. Geeſe love not to ſit but upon their own eggs, at leaſt the better part muſt be their own; if you take them from them at firſt, as they lay them, they will lay on even to a hundred, till ſuch time as their fundaments ſtand gaping open, not being able to ſhut them, by their own laying. Maiſon ruſtique, fol. 107.

Of penning geeſe and ducks at night.

§. 14. I aſked a notable dame why ſhe penned up the ducks and geeſe, and the ducklings and goſlings at night; ſhe ſaid it was, in the firſt place, becauſe theſe laſt were young, and for fear the hogs ſhould meet with them, and eat them: I aſked her why there was not the ſame danger by day; ſhe ſaid, there was ſome danger, but not ſo much, the old one keeps them then, for the moſt part, in the water, and when they are penned up they are more ſecure from the ſtote: ſaid ſhe, we pen up the geeſe and goſlings much, by day, when young, becauſe the gooſe is not ſo careful as the duck of her young ones, but will keep with the gander and flock, and run up and down with them, inſomuch that the young ones, in following them, will frequently fall down dead on the ſpot; but the duck will keep with the young ones, without regard of the other ducks. I aſked another dame of theſe things next day, and ſhe agreed to it, and added, that, if pigs once took to eat up ducklings and goſlings, they would never give over till they had eat up old ducks, and geeſe, and gander; the ſows particularly, if kept hungry, were very ſubject to it.

Ducks.

§. 15. Ducks, I am informed, generally lay in the night, wherefore a careful dame drives them then into a lower coop, and feels every one of them, in the morning, during their laying-time, to ſee whether they have laid that night, or whether they are full of egg ready to lay, if ſo, ſhe keeps thoſe in; if ſhe takes not this method, they lay about in ſo many holes, that ſhe is apt to loſe their eggs.

I was ſaying to a certain dame, that I thought there was little profit in ducks and geeſe, for ſeveral reaſons, and that there was little they could feed on, but what the hogs did and could find out; ſhe replied, that ducks, whilſt pigs fed on corn, would follow the pigs, and live very well on their dung; I aſked whether it was ſo with geeſe; ſhe ſaid, ſhe had not obſerved them to do it.

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[e] Singulis maribus ternas fœminas deſtina; nam propter gravitatem plures inire non poſſunt. Colum. fol. 193. & Palladius, fol. 59.

Of ducks ſetting.

§. 16. This day (April the 24th) my ſervant was wondering to a dame in my neighbourhood that my ducks were not for ſitting, notwithſtanding they had laid out their laying of eggs; the dame replied, that was no wonder, for ſhe did not expect her own ducks ſhould ſit under a month yet; for, ſaid ſhe, ducks have two layings of eggs, and do not ſit to hatch till the laſt, which is about the middle of May; if you will, ſaid ſhe, have early broodlings of ducks, you muſt ſet the firſt layings under hens. Neither the Rei ruſticæ ſcriptores, nor Worlidge ſpeak of this.—Note, (April the 12th, 1707) this day I have two ducks that have been ſitting this fortnight, but this is not very common.

Of fatting poultry.

§. 17. Columella adviſes to put aftermaſs hay under fatting-poultry in their coops, for if they have a hard bed, they will not eaſily grow fat; and to keep them in a warm, cloſe, and dark place, that they may move as little as poſſible, for cold and motion are a great hindrance to their fatting.

Of cramming.

§. 18. In cramming turkeys and chickens, ſaid the princeſs's poulterer, be ſure you give them time to ſwallow before you give them more; for, if you cram it down too faſt, they will not thrive with their meat: he ſaid further, that the prime ſeaſon for a pullet is before ſhe has laid, or a week after, for after that time the ſtraining herſelf has ſo weakened her, that ſhe pines, and her fleſh eats not well.

Poultry degenerate.

§. 19. In poultry, if you keep long in the ſame ſtrain, the young ones will degenerate, and oftentimes die before they come to maturity; it is the ſame with pigs and calves.

PIGEONS.

Of the pigeon-houſe.

§. 1. IN pigeon-houſes, many build a lower window in the wall under the eaves, to open and ſhut at diſcretion, to let the young pigeons of every latter breed (which are weakeſt) out the ſooner, they being not ſtrong enough to riſe upright through the well of the houſe.

Some ſay, there ought to be double the number of holes, at leaſt, as you have hen-pigeons, beſides what are to be allotted for the cocks; becauſe the hen-pigeon, whilſt ſhe has young ones in one hole, will be building and ſitting in another.

It is a great doubt whether it is beneficial to a pigeon-houſe, to keep the holes clean from the dung and trumpery.

Varro [a] calls the pigeon a very cleanly bird, and adviſes to ſweep the dove-houſe, and clean out the filth frequently all the year round; for the neater it is kept the livelier the bird, adds Columella; the whole place, ſays he, and even the holes, ought to be white-waſhed, the pigeon being particularly fond of that colour.—The Roman epicures had a cuſtom of breaking the legs of the young pigeons, that, not being able to move, they might fat the better.

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[a] Varro (lib. 3. de Re ruſtica, fol. 70.) ſays, permundæ ſunt enim hæ volucres, itaque paſtorem columbaria quotquot menſibus crebro oportet everrere. Columella ait (lib. 8. fol. 190.) totus autem

[b] Didymus directs us to hang up ſprigs of rue at the entrance, and in many places of the dove-houſe, which, he ſays, is good to drive away vermin. The old authors agree in the ſame thing in regard to hen-houſes.

Of pigeons pairing.

§. 2. It has been a queſtion with many, if dove-houſe pigeons pair or not, and keep true to their plighted love, which it ſeems to me they muſt do, becauſe we often find in their hole a pair of eggs and a pair of hatched pigeons near fledged, which eggs are ſoon after hatched alſo, which could not well be, unleſs the cock fed the young ones whilſt the hen ſat.

Dry weather bad for the breed.

§. 3. We had no rain all April and May, and had never ſo poor pigeons in that ſeaſon; the reaſon ſeems to be, becauſe the corn in the fields was dry, there having been no rain to moiſten it; for young birds muſt have what is tender of digeſtion, and ſo we treat all ſorts of poultry.

Of their feeding on the ſeeds of weeds.

§. 4. Towards the end of the month of June, in the pigeons benneting time, I entered my pigeon-houſe to ſee, in caſe there were any young ones, what ſeeds they had in their crops; I took half a dozen young ones; beſides what corn they could here and there pick up, I found much charlock-ſeed, and the ſeeds of the common creeping crow-foot or butter-cups (in their crops) which is a ſmall, flat, and ſharp-pointed ſeed, (vid. Ray, fol. 581.) and afterwards did obſerve great flocks of pigeons to light in thoſe fields, where that plant grew plentifully, at the time of it's ſeeding.

July the 19th I had a pigeon killed in the field, and opened his crop, which was full of the before-mentioned butter-cup ſeeds, and fumitory-ſeeds, and nothing elſe, ſaving half a dozen bud-flowers of charlock, and two or three oats; I obſerved they were very voracious of theſe ſeeds; for I had three acres of arable, which had laid down to graſs two years, and that had more butter-cups in it poſſibly than my whole farm beſides, in which my whole flight of pigeons lay all day, and in a piece of wheat near my houſe, which had much ſumitory in it; you may ſee, where theſe plants grow in fields near pigeons, the ſeeds picked off: they are therefore of great uſe in ridding the fields of weeds.

Of feeding pigeons.

§. 5. It is not to be doubted, if you, in winter, feed your pigeons, but others from other dove-houſes will come to the table in your dove-houſe, by obſerving them ſleek, and in good liking, or by ſmelling the ſort and plenty of food they have in their crops, as well as is elſewhere noted of rabbits.

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tem locus, & ipſæ columbarum cellæ poliri debent albo tectorio, quandoquidem eo colore præcipuè delectatur hoc genus avium. Pulli fractis cruribus citius pingueſcunt, nam fracta crura non plus quam bidui, aut ad ſummum tridui dolorem afferunt, & ſpem tollunt evagandi. ib.

Nam quanto eſt cultior, tanto lætior avis conſpicitur. Columella, fol. 190.

[b] In feneſtris & oſtiis aliiſque pluribus columbarii locis, rutæ ramulos deponito, & ſuſpende; habet enim ruta naturalem quandam contrarietatem ad beſtias. In Geoponicis ex Didymo, fol. 773. lib. 14.

Water neceſſary near a dove-houſe.

§. 6. A pigeon-houſe will not thrive unleſs very near water; not but the pigeons can go far for water for themſelves, but their returns muſt be very frequent and quick for their young ones, who are wanting much water, and by carrying it far, it will be dried up in their crops before they can bring it to their young.

BEES.

Of bees in general.

§. 1. WHATEVER you do to bees muſt be in the morning and not at night by a light; for every bee that is diſturbed and ſtrikes againſt the light, is loſt and chilled by lying out.

The honey-bee never draws it's honey from the broad-clover, for it's proboſcis is not long enough; it is the humble-bee that feeds on that. The beſt proviſion for bees early againſt the ſpring, is by ſowing turnips in Auguſt, which will flower in the ſpring, from whence the bees extract abundance of honey: they draw abundance of honey alſo from the vetch-bloſſoms, but never lie on the pea.

A ſouth-weſterly expoſition is better than a ſouth-eaſterly; for the ſouth-eaſterly calls the bees out too early in the morning, and in a ſouth-weſterly they will work an hour later at night. If a hive will not ſwarm, ſo that you are forced to raiſe the hive, you muſt be ſure, before winter, to take the prop from under the hive, and though they have worked down into the prop, the combs muſt be cut away, that the bees may lie cloſer and warmer, for the reaſon why a ſmart comes to nothing, is, becauſe they are too few in the hive.

Their manner of breathing.

§. 2. This day (September the 15th) I could not but recollect what Pliny ſays of flies, that they breathe not from their mouths, but from porous parts of their bodies, in which opinion I was confirmed; for a bee had fallen into my garden pond, and was labouring at the oar to get out; I wondered to ſee, from the ſides of his body, divers quick curling ſtreams on the ſurface of the water, which extended two inches long from each ſide of the bee, and each ſtream was diſtinguiſhed and divided from the other like the points of a compaſs; I ſaw plainly this could not be from his legs, and his wings laboured but little; I was ſatisfied theſe ſtreams proceeded from the porous portals his labouring breath came out at, which iſſuing with force (for otherwiſe it could not have made ſo long ſtreams) may give ſome account how the vibration of his wings on thoſe portals makes his wind-muſick, and plays thereon as we do on a flagelet.

Of hives.

§. 3. The 16th of January was a ſtill fine froſt, and at noon it was fine and warm in the ſunſhine; I obſerved it to invite many bees out of my hive, eſpecially out of my boxen-hive, which ſtood under my ſtraw-hive, and in the ſunſhine I ſaw them play; I ſaw here and there one fly out of another ſtraw-hive, but very few; the next day I told between twenty and thirty that lay dead on the ground under the hive, and at the hive door, with a hoar-froſt of the night covering them; note, the entry-hole of this hive was very open, wherefore I do infer that ſuch entry-hole, being large, lets not only the cold and wind in, to their prejudice, but the ſunſhine of the winter to their utter ruin: I do infer likewiſe that theſe boarded hives are not ſo warm in winter to reſiſt the cold, nor ſo able to reſiſt the ſun either in ſummer or winter, as the ſtraw-hives, becauſe the heat and cold cannot penetrate, where the particles of each injected have their powers broken by ſuch a numerous body of twiſted ſtraws, between each of which there is a ſort of vacuity, which muſt needs make the froſt and ſun break their lines; whereas timber being porous, and yet a continued body, the heat and cold paſſes through it without interruption; ſo that, I believe, the ſun has too immediate an influence on the bees in thoſe boxen-hives to their great prejudice, both at ſpring and winter.

Mice and moths pernicious.

§. 4. Mr. Cherry's gardener of Shotsbroke had put, during the winter, a piece of ſlit trencher before the bee holes, with two little arched holes cut in them, to let the bees juſt have room to paſs in and out; I thought it had been for warmth, but he ſaid it was to keep out the mice, which would ſoon, in the winter, deſtroy a hive: he ſaid the moths were likewiſe very pernicious to bees; for they would get into the hives towards the latter end of ſummer, and at the bottom of the hive, about the edges of it, lay their eggs, which at the latter end of ſpring come to great maggots, and crawl up and down the hive from comb to comb, ſucking the honey; thus, he ſays, he has known five or ſix hives, in a ſeaſon, deſtroyed by them; his way is to lift up the hives, and examine them, after Michaelmaſs, and deſtroy ſuch eggs; he ſays, the mice get not into the hives all the ſummer long; for then the bees are ſtrong and lie before the hole all night, and will not let them come in.

H A Y.

Of making hay.

§. 1. I Was taking notice that ſome hay my ſervant had bought for me had loſt it's ſmell, which could not be from the rain; for none fell that year in the hay-making time, but it had laid abroad in the dew without being made into cock; and this is frequently the caſe of hay below our hill; for below the hill after it is laid in ſwarth and tedded, that is, ſcattered abroad, they do not cock it till they cock it for good and all; whereas in the hill-country they cock it the ſame day it is tedded, if it be a hot day.

Making broad-clover hay.

§. 2. If you will make aftermaſs broad-clover, I hold it beſt not to let it lie one night in ſwarth, but againſt every night to cock it in large cocks to ſecure it from the dews, which, at that time of the year, fall very largely; for the dews ſoke into the broad-clover, and thin the ſpirity juice, and thereby make it volatile and eaſily exhauſted by the ſun; whereas, if the ſpirity juice, which is of a conſiſtency, be not thinned by the water getting into it, the ſun will fix it, by drawing out the watery part from it, but if it be thinned by adventitious water, by reaſon of ſuch thinneſs of the body, it will all evaporate: it is true, by laying it in ſwarth night after night, it will ſooner be hay, but then the hay will be ſpoiled; for the drineſs of the body proceeds from the above precipitate manner of exhauſting the ſpirituous juice by letting in the water[a].

Great burnet hay.

§. 3. They count the great-burnet hay in Leiceſterſhire, the beſt ſheep-hay, and the beſt horſe-hay.

Hay better in a reek than barn.

§. 4. I was ſaying, at the appraiſement of the hay in Sir Ambroſe Phillipps's great barn, at which I was preſent, that I would not make uſe of that barn for my hay, unleſs the ſeaſon of hay-making was wet, but put it without door in a reek; to which the keeper replied, that he owned hay came better out of a reek than a barn, and that hay reeked abroad required much leſs making, having a paſſage for the air and wind to qualify it.

I was propoſing to ſet up a [b]reek-houſe for hay in my meads; ſeveral of my oldeſt and moſt experienced labourers ſeemed to be againſt it, but I could not have a reaſon, only they ſaid, hay never came ſo well out of a reek-houſe as out of a reek, and one of them ſaid, the reaſon was, it never lay ſo cloſe; the timber poſts, bearing againſt the hay, kept it from ſinking cloſe, and ſo it lay too hollow; I replied, that then in making the reek, room of a foot ſpace within the timbers ſhould be allowed it for ſinking, which caution, I take it, ſhould be always uſed in ſuch caſes.

Of making a cock.

§. 5. In making hay-cocks it is of great conſequence to ſee that the cocks are made with a narrow bottom, and round head; for where they are made with a broad bottom and ſharp top, pyramidwiſe, the cock ſinks flat, and ſquats down, and lies ſo wide, and broad, that rain damages it greatly, whereas a round top with a narrow bottom will ſave the cock from rain.

In making hay-cocks, in order to be carted, I find by experience, that they ought to be made large (from a dozen to fifteen to a load, which they ought not to exceed) becauſe the fewer make a load, the ſooner they are loaded, and the greater is the diſpatch, and, if they are ſet out in rows it is the better; leſs time is loſt in going from cock to cock; the more hay-cocks you make, the more bottoms, and, in proportion to the hay, more lies on the ground, and conſequently, if the ſeaſon be wet, it is by lying long on the earth liable to more damage; a little cock is apter to fall flat, and, if rainy weather comes, what with the bottoms and tops, it all takes wet, there being little in the middle; again, being light of weight, it cannot compreſs itſelf cloſe, but is hollow, and ſo takes in the rain, and, if you cart in the dew, or when the ground is wet, there is more hay ſpoiled by raking in the wet, where are many ſmall cocks, than where a few great ones.

Of it's ſweating.

§. 6. It ſeems fit to be conſidered in the buying a hay-reek, how far the hay-reek may have heated when it was made, for, if it heated well, provided it be not too much, the hay will yield the more loads, becauſe in ſweating it falls ſo much the more cloſe; whereas, if the hay was put up over-ripe, it will not ſo well anſwer expectations in the quantity, it lying ſo much the hollower.

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[a] For making St. Foin or French-graſs hay, ſee note extracted from Mr. Tull, under the article Graſſes, §. 50.

[b] Dutch barns had not been introduced, or were but little known in our author's time.

Of old and new hay.

§. 7. An antient experienced farmer tells me, he always found old hay as good for cattle, till the latter end of the year, as new; but then it grew too dry for them.

Short hay weighs beſt.

§. 8. We found it manifeſt this year, in hay-making, that ſhort hay of the ſame bulk out-weighed long hay abundantly.

WOOL.

Growth on the ſheep's back.

*See mowing.

§. 1. ONE of my labourers in *mowing complained of the old rowet that choaked up the ſcythe, and compared it to the young wool, which, when ſheep have been pretty well kept in the winter, and then checked in the ſpring, comes up under the firſt wool, and deadens the ſheers, ſo that it is troubleſome to cut.

I immediately went to another, who I knew had been a ſhepherd, and had ſheered much, and inquired of him concerning ſuch wool; he ſaid, it was true, that, if ſheep are kept well at the forehand of the year, and have a check in the ſpring, and then comes a fluſh of graſs on the firſt rains, their winter wool will grow no more, but a young wool will ariſe, and caſt off the old wool, ſo that one may almoſt wipe it off with one's hands; now if the young wool is not grown ſo long, but that the ſheers ſlide over it, or between the young and old, then it is not troubleſome to ſheer; but if it be grown ſo long that the ſheers muſt cut it, then it choaks up the ſheers, and makes it troubleſome; and in drawing the wool out with one's finger and thumb, to ſee the fineneſs of the thread, it will part.

When wool grows faſteſt.

§. 2. I ſold my wool to a fell-monger, and we happened to fall into an argument what time of the year wool grew faſteſt on the ſheep's back; he ſaid, it grew faſteſt that quarter of the year which was between Chriſtmaſs and Lady-day; I wondered at that, becauſe it was the coldeſt quarter of the year; but he anſwered me, it did grow faſter then, than from Lady-day to the 17th of June, which was the day I ſheered, for, ſaid he, the wool ſtops in growth long before that, and begins to looſen from it's root, and a new wool growing thruſts it out.

This put me in mind that the fleeces in the eaſtern countries might be eaſier plucked, and with leſs pain to the ſheep than we imagine, if they nick the time in doing it, when the wool looſens from the ſkin of the ſheep.

Wool on the ſheep affected by the weather.

§. 3. May the 19th farmers Box, the father and ſon, and farmer Iſles, farmer Stephens, and young farmer Sartain of Wilts, all agreed, that wool grew faſter on the ſheep in dry than wet ſummers (for from the growth of the ſheep the wool depends) and that all ſorts of cattle fatted then faſter, and grew faſter than in wet ſummers, if they had meat tolerably ſufficient: for continual wet outwardly on their coats waſhes them out, as well as inwardly, and then the graſſes are ſourer alſo; beſides cattle have more hours for eating in dry than in rainy weather.

Of ſwathing ſheep in Perſia.

§. 4. There is a particular ſort of ſheep in Perſia of which they are very choice, their wool is as ſoft as ſilk, and I am well informed, that to preſerve the beauty of it, and keep it to a good curl, they ſwathe their ſheep.

Of wool peeling off the ſheep.

§. 5. When a ſheep's wool peels away under his belly, the ſhepherds ſay, it is, moſt generally, a ſign of an old ſheep; not but that a young ſheep will be ſometimes ſubject to it; that which will beſt prevent the like another year, if young, is to keep him up in caſe.

The ewes that lamb about Lady-day, will have their lambs, by the quickneſs of the graſs at that time, ſo briſk and forward, that with ſucking and butting they will have beat all the wool bare from the ewes belly by the time they come to be ſheered.

Of Spaniſh wool.

§. 6. Mr. Methwin and Mr. Holliday, clothiers, ſay the Spaniſh wool is not near ſo fine and ſo good of late years, not above half ſo fine as it was formerly; the fineſt, they ſay, comes from Segovia in Spain; the ſame they ſay of Herefordſhire wool.

Fine feed makes fine wool.

§. 7. Tho' one farm and another is ſaid to have better and worſe wool, yet the rule is very uncertain; it is according to what ſort of ſheep a farm keeps, which may occaſion a great alteration in it, for ewes carry finer wool than weathers and hogs; again, the wool is improved according to what graſs one gives the ſheep, clover-graſſes raiſing a coarſer wool; again, it depends on what ſort of hay the ſheep have at winter; the better the hay the finer the wool; and hill-country hay, if one has enough of it, will bring finer wool than the next farmer ſhall have, who buys a vale hay.

If ſheep are abuſed in their keeping ſo as to pitch, their wool, tho' never ſo ſhort, will handle hard and rough, be curled, and not run into a ſtrait thread, and break off in combing.

Short graſs beſt for the wool.

§. 8. At Biſhops-Cannons and all the Cannons, where the wool is ſo fine, and the land ſo good, they keep their feeding as cloſe as may be; for they count, amongſt them, the ſhorter the ſheep's paſture the ſweeter; if ſo, it muſt be more ſo with us, where the ground is poor and ſour. The wool from Wodcote-farm, which is contiguous to me, will out-ſell that from Crux-Eaſton, becauſe their ſheep feed on the downs, and ours on the corn-leaſe.

Fallows produce good wool.

§. 9. In Iſbrants Ides Hiſtory of his embaſſy from Muſcovy to China, printed 1706, he ſays, fol. 189. the mulberry-trees in China are managed in a manner different from all other countries; for they are kept low, and annually lopped, as the vineyards are; becauſe, ſays he, the young ſhoots occaſion the production of the beſt ſilk; and indeed the difference between the ſilk produced by thoſe worms which feed on the firſt leaves, and that of the latter growth, when they are much harder, is very conſiderable.—I note this, becauſe I have made a remark before, how the beſt wool proceeds from graſs growing on fallows, which proceed from a ſeed of the ſame ſummer, and there ſeems to be a great affinity between wool and ſilk.

§. 10.

Burn-beaking prejudicial to the wool.

§. 10. Burn-beaking the downs will be a great prejudice to the ſtaple of wool; for, though the bulk of wool may come off the vale, yet it is moſt born and bred on the downs, from whence the vale-men buy their ſheep, or otherwiſe they would not have ſo good wool; and though particular parts of the vale, as all Cannons, &c. produce a fine wool, yet the reaſon of that is before given.

Wool of old ſheep fineſt.

§. 11. Mr. Biſhop's ſhepherd of Dorſetſhire ſaid, the older ſheep grew, the finer was their wool, and the leaſt of it.

Of ewe and lamb-wool.

§. 12. Where the ewe-wool is deareſt, the lamb-wool is cheapeſt; for the ewe's wool ſells for it's fineneſs, but the lamb's wool for it's length.

Of lamb's wool.

§. 13. Mr. Bell of Marlborough, coming to buy my wool, aſked me whether I ſheared my lambs at Midſummer, as I did my other ſheep; I told him yes; becauſe, ſaid he, many will ſhear their lambs a month after; for the wool is ſo much the better for being the longer, the ewe's wool the ſhorter the better, the lamb's wool the longer: I aſked how much it might yield the more for being a month's growth the older; he ſaid, a penny perhaps in the pound: I anſwered, twice ſhearing made two troubles and charges, and I knew not whether it would turn to account.

I told my ſhepherd what Mr. Bell ſaid about ſhearing the lambs early; and he replied, if the lambs were late ſhorn, they would not at Michaelmaſs carry ſo good a body and look ſo full, nor carry ſo good a price; ſome ſhear them ſo ſhallow as to leave a good coat behind, becauſe they may look more burley at a fair.—Quære therefore, if I ſhould not ſhear thoſe later which I keep myſelf.—Aſking my ſhepherd this queſtion afterwards, he ſaid, it would be two troubles both in waſhing and ſhearing, and chargeable, more than the profit on the wool would come to, and the ſooner we ſheared our lambs, the more wool they would have when they were ſheep.

Wool of colley ſheep.

§. 14. I aſked Mr. Townſend and Mr. Fry, clothiers, the reaſon why Hertfordſhire wool ſhould be the worſt in England; they ſaid it was certainly ſo, and that they affected the ſort of ſheep they had, as a very large ſheep, which, ſaid they, are of the colley ſort, that is, black faces and legs, and their wool is very harſh, mixed with hairs, like dogs hair, and not ſo white as ours.

Black wool.

§. 15. Stevens of Pomeroy in Wilts, deſired to have two or three fleeces of my black wool, and made no ſcruple to give me nine pence per pound for it, though he was loth to give ſo much for the white fleeces; for, ſaid he, the black fleeces are of more value than the white, and he gave this reaſon; in the making a dark-coloured medley drugget, or cloth, the thread of the white being twiſted with the black will effect it without being dyed, and will make much the ſtronger cloth, in as much as all dyes that dye a dark colour do much rot the worſteds; but the dyes of light colours, being only a light ſtaining of them, do not ſo much hurt the wool.

Curled wool.

§. 16. When the wool-man was weighig my wool, he ſhewed me the difference of ſome fleeces in goodneſs, and particularly the locks of ſome fleeces that were curled, and ſaid, ſuch wool was not, by a penny in a pound, ſo fine, as that which was ſoft and ſtrait, nor would ſuch wool lie fine and ſmooth in the druggets.

Goodneſs of wool.

§. 17. I was arguing with my wool-man on the qualities of wool, and inſiſted that, tho' they judged according to the fineneſs of the thread of wool, yet wool of the ſame fineneſs might be much better than other wool, becauſe the proof and ſtrength of the thread in one ſort of wool, might be better than in another of the ſame fineneſs, by reaſon of better food, being never pinched ſummer or winter, and conſequently having proof to the very end of the hair: he ſaid, that wool impoveriſhed by ill-feeding or ſtarving, at any time of the year, was plainly diſcernable; for it would run off thin towards the ends of the hairs more than ſuits with a taper figure. I ſuppoſe the change towards the end is diſcernable as in corn and graſs, when it withers at the top: he allowed my wool was better than my neighbours, for my not pinching them any time of the year.

§. 18. A great dealer in wool aſſures me, that wool of ſixteen ſhillings in the tod is eighteen pence in the tod worſe in goodneſs when three years old; for then it grows ſtarkey and dry, and will not lie ſmooth in the ſpinning; for the oil of wool waſtes very much after two years old.

Edge-grown wool.

§. 19. I was with Mr. Anthony Methwin, a great clothier, and entered into diſcourſe with him of wool; the edge-grown wool, I ſpoke to him of, he aſſured me, was the worſt abuſe the wool-men put upon the clothiers, for the young wool of it was all to be flung away, becauſe it could not be worked up in cloth; he ſaid, wool that pitched, by reaſon of the ſheep's poverty, would tear and break in pieces, and great waſte was made of it, that wool managed as I manage mine, was much the better in all reſpects, and more profitable to the clothier to buy, and tho' it might run a little longer for it, would be extraordinary good for clothing: he agreed with me, that fallows always produced better wool than the very ſame ground when laid down to graſs, and ſaid, the longer a ground lay to graſs, and the older the graſs was, it was the ranker food, and the wool coarſer; for which reaſon the fallows having new young graſs in them, produce ſo much the finer wool; he did, for the ſame reaſon, aſſent, that the hop-clover generally ſpeaking (eſpecially in clay-land) might produce a finer wool than it's natural graſs; that the thicker and cloſer wool handled, and ſtraiter in it's threads, and not curled, it was the finer, and laid ſmoother in the piece of cloth: That wool, added he, in the ſheep, that hangs leaſt under the droppings of the other, is the fineſt, ſuch as the neck, and breaſt, and belly.

Of the pitch-mark in wool.

§. 20. I find the pitch-mark, if it be not worn out before ſhearing-time, the wool-men do not like, becauſe, ſay they, we have no help but to cut it off, whereas, tho' the ruddle, if the ſheep be much ruddled, weighs to our loſs, yet that waſhes out.

Of binding wool, and of it's growing.

§. 21. Wool increaſes by lying by, and, if put up hollow, will in two or three years feel very cloſe, and be intangled, which is occaſioned by it's growing; but it will not grow till after it's ſweating is over, which is not till Michaelmaſs.

It is generally agreed, that wool, being bound up very cloſe, ſo that the wind cannot get into it, will pay intereſt in growth till towards the next ſpring, but ſhould be ſold before the March following, leſt the winds of that month ſhould dry it too faſt.

§. 22. The wool-man having bought my wool, and coming to weigh it, aſſured me, that by the tumbling and removing the wool, and letting in the air to it in the carriage, it would loſe in the weight, a pound in the tod, before he got it home: from hence it follows, that to move your wool in the loft, or from one room to another is loſs, or to tumble it up and down in ſearch of mice.

Of the wool-loft.

§. 23. When wool-men buy not at the firſt hand, when the wool is ſheared, they care not to buy in the winter; for the damp and foggy air gets into the wool in winter, which makes it weigh heavier; therefore the chapman chooſes not to meddle with it till ſpring.

Time for ſelling.

§. 24. I find, by Mr. Brewer, Mr. Methwin, and many more clothiers I converſed with in Wiltſhire, that the wool-breakers do, in the firſt place, ſeparate the fleeces by themſelves that run moſt of a ſort.

Of the ſeveral parts of the fleece.

Then they ſort the different kinds of wool in each fleece by itſelf, which fleece is never divided into leſs than four parcels, viz.--The tail-wool is laid aſide for liſts for cloth, rugs and blankets.—Half the buttock towards the flank is for the long wooſted thread, in ſerges and druggets, which they call the wooſted, and runs the length of the ſerge or drugget, which, tho' ſpun to a finer thread, yet is harder than the abb, which croſſes the wooſted thread, and runs the breadth, yet is of a coarſer wool: but Mr. Merryman, clothier of Newbury, denies that any of the buttock is fine enongh for the wooſted thread.—What is on the back and ribs is ſomewhat finer, and makes, in druggets, the thread called abb; which runs croſs the chain, called the wooſted, and is of a finer wool than the buttock, and twiſted in the thread looſer.—The neck, and breaſt, and bottom of the belly make the thread which in the fineſt cloth is the chain, called the warp in cloth, which anſwers to the chain or wooſted thread in druggets; but the abb in cloth, which anſwers to the abb in druggets, is all made of Spaniſh wool, which, being finer, will come cloſer together, and the finer it is made, tho' the thinner, yet will keep out rain the better: but Mr. Merryman of Newbury, clothier, will not believe the neck and breaſt fine enough for the chain.

HIDES.

§. 1. ACCORDING as the beaſts were in proof, in fleſh and fatneſs, proportionable is the value of the hides, and ſuch will be the proof of them under the hands of the tanner; for example, as young meat and fat meat plims and increaſes in the roaſting and boiling, but lean and old ſhrinks, ſo a hide of a young and fat beaſt ſwells and thickens in the tan-

Of the quality of hides.

pit, and yields a proportionable increaſe according as the beaſt is young and fat; but the hide of a lean and old beaſt ſhrinks and loſes it's ſubſtance in the tan-pit, and will not take the tan as a young hide: therefore a murrain hide is of ſmall value, unleſs it be the back part, to make a pair of boots, to which purpoſe it is uſeful, on account of it's ſhrinking and cloſing of the pores; the very beſt of the hides are bought by the bridle-makers, becauſe they are required to be of the beſt ſubſtance: the value of a hide is known by it's weight, by lifting it with the hand, as it weighs heavier or lighter in proportion to it's largeneſs or ſmallneſs, nothing being a greater commendation of a hide, than to weigh much heavier than one would expect from the ſize of it.

The north-country hides are the beſt, and thickeſt, and generally handle beſt, the reaſon whereof probably is, becauſe their feed is deepeſt, and they are maintained always in good keeping, and never pinched.

It is generally agreed, the finer the hide the ſweeter the meat of a beaſt.

Of ſheep-ſkins.

§. 2. The ſkins of the ſheep thicken much, after they are ſhorn: in ſome time after they will grow as thick again as before: I judge this muſt proceed from the cold, and puts me in mind, that the hides of all cattle are thicker grained in the hill-country than in the vale, as alſo of the ſtory (which, as I remember, Herodotus tells) of the Perſians and Greeks, that when they were, on both ſides, ſlain in a battle and ſtripped, the nations were not to be diſtinguiſhed but by their ſkulls; for the Perſians wearing always turbans on their heads, which kept them very hot, their ſkulls were much the ſofter, and would yield to the impreſſion.

RISE and FALL of MARKETS, and their CAUSES.

Of buying early.

§. 1. GENERALLY ſpeaking, the earlier a thing is bought, when the market is open, it is bought the cheaper, for though afterwards many contingencies may have an influence, yet the general condition of mankind, who are not provided with money to buy as early as their occaſions want it, or want to ſell before there is a general demand for goods, muſt favour the ready-monied man, who is provided beforehand; thus, for example, they, who at ſpring of the year firſt buy barren beaſts to fat, or ſheep, have the advantage; for they, who ſell earlieſt, either want the money, or winter-proviſions, as hay and ſtraw, to maintain them till the graſs grows; which is a general caſe of too many; and they, who buy early, do it becauſe they have money before the generality have it for ſuch purpoſes, or a remaining ſurplus of hay, or ſtraw, more than the ſtock of their farm can ſpend, which is the caſe of few, ſo at ſuch times there muſt be regularly more ſellers than buyers.

Plenty of one kind of proviſions affects all others.

§. 2. In the ſummer 1702, there was a great ſcarcity of hay and graſs, for which reaſon beaſts were not fatted in ſo great a number as uſually; conſequently the breed in England of beaſts increaſed; this year, 1703, there was much graſs and hay, abundance of beaſts therefore were fatted, which made beef cheap, and fat mutton, by reaſon of a bane, was cheap; and ſeeing beef and mutton was to be had cheap, people would give but a low price for cheeſe and bacon: ſo that any one kind of food being cheap is apt to lower the price of all other ſorts.

Scarcity of beef makes lamb, &c. dear.

§. 3. From the exceeding laſt year's hot ſummer, 1719, whereby fewer beaſts were fatted, and hay very ſcarce the ſpring following, beef yielded five pence per pound; this made fat lamb ſell exceeding dear, not only at ſpring but all along June and July; the reaſon is plain; becauſe there muſt be a great many fat lambs go to make up the failure of each ox's fatting, and meat muſt be had.

Sheep and wheat cheap about September.

§. 4. On the 16th of September wheat was ſinking, and about this time of the year wheat generally falls in price, for the farmers, who live in the paſture and turnip-countries, do, about this time of the year, tumble out their wheat in the markets, and glut them, in order to raiſe money to buy ſheep at Weyhill, and the ſheep-markets, as well as to pay harveſting, and for feeding their ground with wheat.

Wheat ſunk for a few markets, and ſheep, notwithſtanding it was a great autumn aftermaſs for graſs, and a great turnip year; the reaſon of it was, that money muſt be raiſed by moſt farmers out of the produce of their farm at this time of the year (September) to anſwer their many occaſions, and they, obſerving wheat to ſink, thought fit to leſſen their winter ſtock of ſheep, and keep their wheat, becauſe hay, through the wet, was generally damaged, and not great in quantity, and ſo the maintainance of ſheep was like to be chargeable; and conſequently ſuch ſale out of the capital muſt glut the market and ſink the price.

Of the riſe and fall of corn.

§. 5. From the 24th of September to the 20th of October, 1704, the land was ſo dry, that the farmers ſtopped ploughing for, and ſowing of wheat: Mr. Raymond, and Mr. John Horton of Wiltſhire, came to me in a viſit, and I was ſaying to them, ſurely if this weather held a week longer it would make wheat riſe; no, ſaid they, at ſuch a time it ſinks in preſent, becauſe the farmers ſend their wheat to market, which they would have ſowed, but the next year it will be dear: it is the ſame caſe as in a rot of ſheep, every one having ſheep to ſell, for the preſent they are cheaper.

Prices of ſeed-wheat.

§. 6. Generally it may be foreſeen and concluded, that, when the harveſt falls pretty late, ſeed-wheat, of the old year and of the new, will hold dearer, in the hill-country (in proportion to the following price of wheat when the markets open) than when the harveſt comes on early and quick; the reaſon is, becauſe, when the harveſt falls out late, farmers ſow much, in thoſe countries, of old wheat, becauſe they ſow early, which goes a great way in the conſumption of the ſtock at the latter end of the year (i. e. September); alſo, when harveſts fall out late, the farmers can raiſe money ſoon from barley, oats, and peas, becauſe by October thoſe grains are vendible, and ſo they are not forced to ſell wheat ſo ſoon, to raiſe money by that grain alone, to diſcharge the harveſt wages; but when harveſt comes early, old ſeed-wheat may probably ſink in price, vice verſâ.

Cold or grown corn unfit for London market.

§. 7. The nearer the market is to London, the worſe the market is, if wheat be cold or grown.

Prices of barley.

§. 8. From harveſt time through the winter (1705) barley was three ſhillings in the quarter dearer, near Saliſbury, Devizes, and the inland towns, than at Newbury, Reading, and thoſe countries that drove the London trade of malting; the reaſon was, the great ſtock of barley, the traders in malt to London had provided the year before, had glutted the London market, whereas the malſters in the inland trade do not provide great quantities beforehand, and therefore, the crops of barley miſerably failing this hot ſummer, barley bore a better price with them than with us.

Bane in ſheep makes corn dear.

§. 9. I was obſerving to Mr. Hawkins, the great Hampſhire farmer, it was a ſaying in this country, that if corn was dear ſheep would be dear, and vice verſâ; he ſaid, the foundation was in the ſheep and not in the corn, for, if a bane fell on ſheep they would be dear, and, if a bane fell on ſheep, corn would be dear, becauſe there could not be a fifth part of the folding that otherwiſe there would be, and conſequently a deficiency of the crop, and therefore dear; but if no bane, and a great breed of ſheep, corn would, on the other hand, be plenty.

I add to this, that by a bane year of ſheep, it may generally be taken for a rule, wheat will be made dear, becauſe in baning years it is a wet ſpring; but a baned year makes, for the preſent, beef and mutton cheap, becauſe ſuch abundance of mutton muſt be killed, before the bane be too far gone in the fat ſheep, but the rot makes both afterwards dearer; the deareſt time for mutton and beef is Lent, though it is ſcarce alſo the latter end of March and April, but then the plenty of lamb and veal keeps the price from riſing

A bane or rot makes ewes ſell well.

§. 10. When there has been a rot of ſheep, it may be reaſonably expected that ewes will ſell beſt, in order to repleniſh the breed that is loſt.

Scarcity of hay makes lambs ſell well.

§. 11. When there is great ſcarcity of hay againſt winter, it is to be ſuppoſed that lambs will ſell beſt, becauſe they can live beſt without hay.

Prices of cattle.

§. 12. In years of warm dry ſprings, or only of moderate rains, I obſerve, cattle are always cheap, becauſe the breeding counties, which are always the barren, eſpecially Cornwall and the mountainous parts of Wales, tumble out ſo many into our markets, being not able to maintain them; on the contrary, in years of wet and cold ſprings there is a good growth of graſs in the breeding counties; therefore thoſe counties, rather wanting more mouths for their graſs, do not ſend them to our markets, and therefore cattle are dearer; after many dry ſprings, that their breed has been drained by our markets, if a cold wet ſpring comes, then cattle may be expected very dear, as in this year (1709) was the caſe; for then they can ſpare none;

note, though in dry hot ſprings there be a greater growth of graſs in deep cold lands, as Somerſetſhire, &c. for which reaſon it might be thought their demand might ſet a good price to the Welch cattle, yet it is to be conſidered, that in ſuch caſe the greater neceſſity lies on the ſeller; for the Welch cattle muſt ſtarve, if they keep them, whereas no great inconvenience lies on the renter of the deep lands, whilſt his graſſes grow a little the longer only, if he keep off from buying; it is plain in this caſe the Welchman muſt buckle to; whereas in wet and cold ſprings, when the Welchman can keep his cattle, it is as plain the neceſſity lies on the buyer.

Prices of fat hogs.

§. 13. During September, October, and half of November, fat hogs ſold for 4s. 6d. and 4s. 8d. per ſcore; but theſe are whey hogs, i. e. fatted with whey, and drove pretty far from the dairy-countries, which driving, and their ſort of food, takes away the value of the bacon; ſo our hill-country bacon, where the hogs feed on corn moſt of the year, and are fatted therewith, yield ſix pence or eight pence per ſcore the more; about the beginning of November I ſold for 5s. 2d. per ſcore, and thought the price of eight pence per ſcore more a good equivalent; but by the latter end of November I found the hogs fatted ſold at the market for ſix ſhillings per ſcore, at which I was ſurprized, peas not riſing in the price; but inquiring into the reaſon of it, I found that our hill-country bacon ſeldom came to it's full price till about the latter end of November or December, when all the whey-bacon is gone, for, whilſt that is plenty in the market, it keeps down the value due to the hill-country hogs, though at the ſame time they may yield eight pence per ſcore more, yet ſeldom ſo much then as they do afterwards; therefore it is good huſbandry not to be too ready to ſell our hill-country fat hogs.

A dry ſummer makes young pigs dear.

§. 14. This ſummer, 1720, young pigs on a ſudden grew dear all over England; the time they firſt appeared to be ſo was about the middle of June, and the reaſon for it was (as aſſigned by the farmers about Holt) becauſe the laſt ſummer was as hot and dry as had been known for ſome years, for which reaſon the quantity of whey was much leſſened in the dairy-countries, and the crop of corn, particularly peas, run very ſhort; and ſo the breed, which would have been otherwiſe preſerved, was ſent to market for the ſpit.

When to buy cattle.

§. 15. If a dry ſpring ſhould come, with a ſucceeding hot and burning ſummer till Midſummer, ſo that the firſt crop, or burden of graſs, be loſt, and, being under-ſtocked with cattle, you have a hay-reek in ſtore, you will have good encouragement to buy; for in ſuch caſe you may buy very cheap, and will be very well paid for the hay they ſhall eat; for you may expect a great aftermaſs, the earth not having then yet exerted her ſtrength; for the hot ſun thereon will have been equal to a dunging; but then you ought to buy your cattle half fat, that your aftermaſs may finiſh their fatting.

Lean and barren cattle are dear after wet ſummers.

§. 16. This ſummer (anno (1720) about a month or five weeks before hay-making, there fell ſo much rain in moſt parts of England, that the water-meadows were overflowed, and very much ſtranded, inſomuch that in ſeveral places they ſold the hay to them who would cut and carry it off: in general they made the hay up in reeks, with deſign to buy-in lean cattle, after Chriſtmaſs, and early in the ſpring, for fatting, and ſo to get them forward in fleſh.——Note therefore, when ſuch wet ſummers happen, doubtleſs lean and barren cattle for fatting muſt after Chriſtmaſs, and towards the ſpring, be dear, becauſe a large demand for them for that purpoſe may be expected.

Conſequences of dry weather in June and July.

§. 17. This year (1704) there was a plentiful ſpring for graſs, but no rain fell all June and July, and ſo the graſs was all burned up; from whence I inferred, firſt, that beef and mutton would be dear by September; for by that time the forwardeſt beef and mutton would be ſpent;—ſecondly, that barren beaſts would be ſcarce and dear the following ſpring; becauſe, there having been plenty of graſs in the ſpring, few beaſts would * go through;—thirdly, that cows with calf, that had been early bulled, would be plenty and cheap at Chriſtmaſs for fatting, and yet not eaſily to be fatted, by reaſon of the dry months of June and July.

* Not prove with calf.

Of a cold dry ſpring and ſummer.

§. 18. There had been (anno 1716) a cold dry ſpring and ſummer to the very autumn, i. e. the latter end of Auguſt, ſo that there was but a ſmall crop of hay, and the aftermaſs ran very ſhort, rain coming too late to bring it to any length before winter came, and turnips alſo failed; whereupon it was the opinion of both Mr. Biſſy and William Sartain, two Wiltſhire graziers of great experience, that beef would be very cheap till Chriſtmaſs, becauſe the graziers would ſell off their beaſts the forehand of winter, though but half fat, for want of hay; but that beef would be very ſcarce and dear in the ſpring, and the rather, becauſe very few old cows, that have had damage, or went through, will be turned off to fatting at autumn, for want of hay; but will be milked another year: this will alſo make mutton very dear at ſpring.

When graſs is plenty the beginning of ſpring, &c.

§. 19. There is no hopes of a good year for the graziers when graſs is plenty at the beginning of ſpring; for then they buy their cattle dear, and yet meat will be cheap all that ſummer; for ſo many will buy-in for fatting, that, though the ſummer ſhould prove never ſo dry, yet ſo many beaſts will be made half fat by the ſpring-graſs, and muſt of neceſſity be fatted out, that beef muſt needs be plenty.——On the contrary, a good year for the graziers is, when, for want of graſs in the ſpring, barren cattle ſell cheap, whereupon fewer buy for fatting; and then rain coming plentifully, the beaſts being bought cheap, and a ſcarcity of beef in courſe following, and the grazier having plenty of graſs to keep cattle in for a market, makes them pay well.—And note, that in wet forward ſprings barren cattle may be expected to be ſcarce and dear the year following, becauſe beaſts being well in caſe take bull and go not through; the contrary may be expected in backward ſprings, eſpecially when winter-meat proves ſcarce.

A hot and dry ſummer occaſioned the cheapneſs and afterwards the great dearneſs of cattle.

§. 20. Laſt ſummer (anno 1719) was very hot and dry, and ſo little rain fell, that the crops of both hay and ſtraw fell ſo ſhort, that the vale-farmers, for want of winter-proviſions for their cattle, ſold cows after Michaelmaſs for thirty ſhillings a-piece, which ordinarily were then worth 4l. per cow.—It was as forward and plentiful a ſpring for graſs the ſucceeding April and May as had been known for many years; yet cows ſold cheap, becauſe the ſtock of cattle, ſo few having been fatted, was ſtill too great; but after Chriſtmaſs beef was ſo very dear, that, take the whole quarter of an ox, it yielded a groat per pound: bulls alſo were exceſſive dear this ſpring; a bull that ordinarily would yield but 40s. ſold for 3l. 10s. or 4l.—The reaſon was, becauſe, the wintering of cattle having been very chargeable, the bulls were ſuppoſed not to anſwer the charge of wintering ſo well as other cattle; ſo the farmers killed them, though but juſt wholſome, and ſold them for a farthing, and an halfpenny a pound, and eat them in their families; ſo the great ſlaughter that had been of them the winter before made them very dear in the ſpring.

When beef is cheapeſt.

§. 21. October and November are the cheapeſt times for beef, becauſe there is then a glut occaſioned by the old cows, which are turned off by the dairy at May-day to be fatted, and are killed in thoſe two months.

WEATHER.

Effects of dry weather.

§. 1. THIS year (1712) was hitherto (June the 20th) a very hot ſummer; it was a dry February and March, then a little rainy the firſt week in April, then no rain till about Mid-may, when we had a hard thunder ſhower, which went to the roots of the corn; then no rain till the beginning of June, when fell moderate rain, for half a day, enough to go to the roots of the corn; then no rain till this day, June the 20th, when a hard ſhower, of two hours, went to the roots of the corn.—This hot ſummer, with ſo little rain, had this effect upon my oats, as follows.—In November I had ploughed up forty acres of white poor land, after it was run to a thick ſhort graſs, and had laid down two years to hop-clover, in order that, after it had laid ploughed all the winter, and took the froſts and rains to flat it, the ground might be a fit and mellow bed to receive the oats; but, notwithſtanding the ground was ploughed ſo early, yet, being a pretty dry and mild winter, at the middle of February, when the oats were ſown, the ground required much harrowing, and though they came up well and promiſing, yet, for want of rain to ſoften the ground and mellow it (having the diſadvantage of being ſowed on land not ſufficiently looſened) they did not ſtrike good roots, but dwindled, and by the 20th of June, when they were ſhooting into ear, were very thin, for want of tillowing, and were run into ſpindle, and looked very poor and ſtarving.—The bad condition of theſe oats ſeems to be owing to the drought of the year, and the chalky conſtitution of the ground, which, being lay ground, was not ſufficiently looſened, though ploughed early, and dragged in with the beſt management, in order to help it's natural defects; and therefore, for the future, it is to be obſerved, that a crop of corn ſowed on ſuch white earth, after it has laid down ſo long to graſs, is very much hazarded in caſe ſuch a hot ſummer happens; whereas, if this had been the ſecond crop ſowed to oats, inſtead of the firſt, doubtleſs the ſucceſs would have been much better; for then ſuch white ground, in the ſecond year of it's tillage, would have ploughed up fine and rotten, and the oats, with the drags or harrows, would have been let in as deep as the plough went, and then, being rolled, would have endured the heat of the ſummer, and the want of rain, as I experimented this ſame year, in a crop of oats ſowed in the ſame down, on a black rotten earth, but poor and wood-ſeary, which I had not thought worth ploughing and ſowing; but having ſowed it to oats and French-graſs from lay the year before, and the French-graſs miſcarrying, I ſowed it again to oats and French-graſs this year; the ground turned up like aſhes, as deep as the plough went; I dragged in the oats, and French-graſs ten days after the former, yet both the oats and French-graſs endured the drought and hot ſummer to a wonder, and held till this 20th of June, when rain came, the colour of a ſtrong dark green.—Other fields ploughed up early for oats, after they had laid down two years to broad-clover, ploughing up pretty mellow, and, being clay grounds, endured the heat of this ſummer very well, and held a flouriſhing colour, though ſowed not till the firſt week in March; yet I was ſenſible, through the drought ſeveral of the weak tillows were loſt.—But white land, as aboveſaid, having laid to graſs, is more difficult to be brought to a friable temper by once ploughing than the other ſort of grounds here mentioned, which are of ſtrong clay.—Alſo, when wheat has, the year before, been ſowed to one earth, on whitiſh ground that has laid to graſs, I obſerve, not only, that ſuch ground is more apt to run to rowet in the wheaten crop (whereby the earth is more bound by the roots of the graſs) than clay ground ſowed on one earth, eſpecially if it be a little ſtony; but alſo white earth, in caſe it ploughs ſtiff, does not ſeparate and break, when it is to be harrowed, as the clay, if a little ſtony; and this I plainly ſee by comparing together, this year, ſeveral pieces of barley.

Though our ſpring corn is better in cold clay lands, in the hill-country, in warm than cold wet ſummers, it is apparent to me, not only from this, but from many years obſervation, that, tho' ſpring corn will hold it's colour in a hot dry ſummer, in the hill-country, in clay lands, yet our clays are ſeldom ſo good, and of ſuch depth as to bring to maturity, in ſuch ſummers, all the backward tillows, but the ſtrength of the ground gives off, and the number of ears is not fulfilled, in ſuch caſes, for want of ſeaſonable rains; whereas in rich clays of the vale, where the corn is buried deeper, poſſibly no ſummer is too hot.

Effects of a dry ſpring. How to judge when French-graſs, wheat, &c. have perfected their growth.

§. 2. This ſpring (anno 1707) was exceeding dry from about the 12th of March to the 22d of May; for but one moderate ſhower, on or about the 13th of April, fell, which went not to the roots of the corn, for it brought up none, and but moderately refreſhed any graſs. During this ſeaſon the winds were very parching, the ſun hot by day, but the nights cold: my French-graſs, on a burn-beaked ground, ſowed the year before, was very hopeful at the beginning of March, and ſo on to the middle of March and the latter end of April, and looked ſo green, that I thought I ſhould cut half a load at leaſt on an acre; but from the latter end of April it began to fall off, and to turn towards a fillemot colour, and made little or no growth all the ſpring: on the 22d of May rain fell plentifully, and frequent rains after; I had great expectation my French-graſs would recover it's colour, and alſo grow in ſtem and length of blade, in hopes of which I waited till the 19th of June, but then found all hopes were in vain; for the graſs altered not in colour, and very little in growth, from theſe rains. The very ſame thing happened to ſix acres of wheat I had in very white poor ground, which having loſt it's colour (being within a week or ten days of earing before rain fell) never recovered it's colour after, and put forth a yellowiſh and very ſmall ear: the ſame happened to my French-graſſes ſowed the autumn before with my wheat.—— From hence I obſerved that, when the air and the ſun have concocted the juices of plants, and confirmed and hardened the fibres of the leaves and ſtems (which the air and ſun do rather in leſs time than they otherwiſe would, where there is a poverty of juices) the fibres being ſo fixed and hardened, that they are not capable of being enlarged, and ſo not to be extended by more juices, the juices, ſtruggling for a vent, diſcharge themſelves into ſoboles above the roots, if the plant be perennial, providing tender juicy buds for the next year; for thus it was with my French-graſs, when I pulled up it's roots: from hence I may for the future judge when the hopes of the year are loſt.

Effects of a dry ſpring, &c.

§. 3. This ſpring (1714) was very dry, and the ſummer very hot and dry; it was obſervable, that the increaſe of rabbits, pheaſants, partridges, and hares were very great, and I ſaw many coveys by July the 20th, near as big as the old ones; ſo much does the ſun favour their increaſe in number and bulk, and doubtleſs the increaſe of the vermin that deſtroy them, as polecats, ſtotes, and foxes, hold a proportion; as ſuch ſummers conduce to the deſtruction of the fiſh by reaſon of the lowneſs of the waters, ſo they contribute exceedingly to their multiplication and growth; the laſt ſummer being very raw and cold, the miller of Long-pariſh complained of the ſmall ſize of his ſpawn, occaſioned by the coldneſs of the ſeaſon, and made it his apology for furniſhing me with no better trout.

Of a remarkable mild winter and dry ſpring.

§. 4. This winter (1713) has been the drieſt and freeſt from rain and ſnow I ever knew, and the mildeſt and moſt moderate for froſts; and the ſpring was alſo cold, and the drieſt, and the ſummer the drieſt, for we had, during the whole ſpring and ſummer, but theſe three rains following, viz. January and February dry, March the 10th, or thereabouts, fell a rain that might poſſibly go to the ſheer-point; then it continued dry till June the 9th, when we had ſuch another rain as the former; it continued on dry with us (though ſome ſtorms did ſcatter in ſeveral parts as we heard) till June the 21ſt, and 22d, when a rain fell, which I believe went to the ſheer-point; and by this time the wheat was ripe in moſt places, and the reapers were ſet on the white oats, and peas were hacking, and ſome barley was cut; it is true, generally ſpeaking, the laſt mentioned lacked above a fortnight of being ripe, the ſpring having been dry and cold, which kept the grain backward; black oats were fit be cut, with me, by July the 28th.—From the account before given, of the dry winter, the cold and dry ſpring, and the hot ſummer, which periods of time, from the beginning of January to the 28th of July, being above ſeven months, take in only three moderate rains, it will be fit to conſider what conſequence it had on all ſorts of corn, and the different properties of the land on which it grew.——Firſt, as to wheat; it was generally very good throughout the kingdom, and flouriſhed ſtrangely on all ſtrong healthy lands; nor did I obſerve any light poor lands ſuffer thereby, ſo as I could impute the weakneſs of the crop to the continued drought; the berry was plump and well coloured, golden coloured and not horney coloured, and no failure of cheſts in the ear, as there was in the laſt cold and wet ſummer; it is true, juſt on the hardening of the wheat the ſtraw did, in many places, give off, ſo as to be ſtruck with a blight, and felt tough and rotteniſh under the hook, but this was for ſo few days before the berry was ripe, and the wheat was reaped, that the wheat being, in a manner, already ripe, the berry did not ſuffer thereby: what I did particularly wonder at, during the fiery trial all corn did ſeem to undergo this ſummer, was, that I had twenty acres of wheat, and the ground being of a cold clayey nature, I had ſowed the wheat under furrow, and laid the ground round in ſmall high ridges, of ſeven furrows in a land or ridge, thereby thinking to lay this cold land dry and warm, (though this land had by nature a dry ſituation, being on the ſummit of my hill-country farm) and the lands being thus laid round were ſo dry as to be duſt, to the eye, before the beginning of June, inſomuch that if I run my ſtick in as deep as the roots of the wheat, and turned up the earth, there was no moiſture to make a coheſion, but the earth ſo turned up fell into the drieſt powder, yet did the wheat of this ground flouriſh, and grow proud in colour beyond any wheat in my farm, though the land was poor, under the fourth crop, and had no dung or fold to ſupport it; and this wheat proceeded to ear, and brought me ten to eleven cheſts in the ears, and perfected the berry, without giving out the ſupport of it, till harveſt; and yet the earth ſeemingly iron whereon it grew throughout the whole ſummer; this evidently ſhews, the clay land of England ought to be ſo prepared by tillage, that the ſun may carry on it's buſineſs of burning and drying it, to the greateſt degree it is capable of doing.

As to the winter-vetch crop of this year, it bore the tedious drought and heat better than the peas, wherever they both grew in land of the ſame kind; in hill-country land, if the mold was any ways light, weak, or pooriſh, they bore up againſt the heat, where the peas gave out, were parched up, and were loſt in bloſſom or kid; this advantage the vetches had over the peas, by having their roots eſtabliſhed during the winter, and by the earth's being well ſettled and cloſed to the roots before the drought came: yet I obſerved, where vetches were ſowed on one earth, on ſtiff land, in our hill-country, which had laid two years to graſs, ſuch vetches did give out at bloſſoming time, and yielded only top kids, and the leaf ſoon blighted after the bloſſoming time was over; which was occaſioned by ſuch land being unfriable, harſh, and churliſh, and ſo did not cloſe to the roots of the vetches, to keep out the ſcorching heat, as did the earth of mellow land, tho' not ſo ſtrong; parcels of whole land ſowed in the ſame field, tho' of a weaker, yet of a more looſe texture, did ſupport the vetches better.

As to the peas crop this year (1714) I obſerved where lands were not of a ſtrong clayey or malmy kind, or of a fat ſandy mold, they failed extremely both in halm and kid: generally all dry, harſh or hungry ground, all ground that was not well worked with the plough, or where the pea was not ſowed early, to eſtabliſh the root before the drought came, and bloſſomed late, there was a great failure both in halm and number of kids, and thoſe kids were very ſhort, and but two or three peas in them.

As to the black oat crop, it being generally (eſpecially in the hill-country) ſown either on light weak land, or on ſtronger land after it has been worn out with three former crops, and for the moſt part being ſown on one earth, they were in general very indifferent and poor throughout the hill-country, yet being uſually ſowed at leaſt a month before the barley, their roots were ſo well eſtabliſhed, and the ground ſo far ſettled to the roots, that, of the two, they eſcaped better than the barley, though that was ſowed in much better ground; in the vale I alſo obſerved a great failure of oats.

In regard to the barley-crop of this year, there was a great failure throughout the hill-country; for the lands there are generally of a lighter, drier, and huſkier nature, and not partaking of the malmy fatneſs of the clays, or of the mellow, rich, hazle mold of the vales; wanting therefore the ſtock of vegetable ſpirits to ſupport the root, and having not that mellowneſs of parts, to claſp about and cloſe to the roots, the barley failed in proportion as the lands did more or leſs partake of the aforeſaid properties, or were later ſowed; yet it muſt be granted, that in the hill-country, where was ſtrong land, or cold clays, if the land was in good heart, worked well with the plough, and ſowed early, ſuch land bore very flouriſhing barley: in the vales, where the earth was of a white malmy clay, of a binding ſand in good heart, or of a fat hazle mold, and in good bean and peas land, well worked, and ſowed early, there was excellent barley; but wherever, in the vale, the land came ſhort of theſe properties, was indifferently huſbanded, or was ſowed late, there alſo was a lamentable crop of barley.

Of a cold ſpring.

§. 5. This year (1709) we had a cold April and May, inſomuch as between Wincheſter and Banbury I hardly ſaw a good acre of corn: but when I went from Banbury all along to Garenton in Leiceſterſhire, I never ſaw better in my life (ſo ſaid the country people, in thoſe parts, of their corn) the reaſon of which muſt be, that the firſt lands, being poor and lighter lands, were penetrated by the colds, and had not ſtrength to ſupport the corn againſt them; but the northern lands, which were ten ſhillings per acre, did ſupport their corn; therefore a cold April and May will not make a ſcarcity, if not wet.

Effects of rain.

§. 6. I look on rain always to carry with it fructifying principles; yet it happens ſometimes, that rains, being very frequent, do beat the fallows flat and cloſe, ſo as to prevent the ground from letting in the ſun and air, and in that reſpect they may be prejudicial.

Wet ſummers (ſuch as in the year 1703) keep that juice, which forms the flour in corn, watery and thin, and hinder it from digeſting and fixing into a firm body; and time loſt is never to be regained by any plant, in any of it's progreſſions, whether as to it's formation of roots or fruit; there are certain progreſſions limited for every day and week, as on the hatching an egg, and any interruption is a prejudice: nature will finiſh what ſhe has undertaken (with a very little regard to the difference of time) whether it be perfect or imperfect.—The wetneſs of this whole winter, which was very rainy, prevented ſo many grains being formed in the ear as is uſual; for it was matter of fact, the ears were never ſhorter; the wetneſs of May and June prevented the grains in every ear filling before it ſhot out of hood; for it was manifeſt there were four or five huſks in moſt ears, at the bottom of the ear, which were not perfected nor filled; and doubtleſs the remainder of June and July, if wet, will make the grain in the ear thin, and the lowermoſt grains more eſpecially.

It ſeems a great deal of rain and wet weather, to wheat in ear, and other corn when it is high, is a prejudice; for thoſe juices, which form and fill up the ear and grain, and faſhion, and make the blade to grow, ſeem to be different; inaſmuch as, both in corn and fruit, it is worſe the wet years, when the blade and ſhoots run longeſt: when the corn is up ſo high, though the ſeaſon of the year be hot, yet the ground is ſo ſhaded as to be in danger of being chilled by much rain; it ſeems that the heat and power of the ſun muſt, the whole time, attend the ground in it's incubation; for none doubts the Weſt-Indies being better ground than England, yet runs the corn up to ſo mighty a ſtubble (to which length it cannot grow till towards the latter part before it's ripening) that to it's length, which runs ſo high, and keeps off the benign influence of the ſun, Mr. Ray imputes the thinneſs of the grain.

Of a wet ſpring.

§. 7. This ſpring (1711) was wet and cold for the moſt part of March and April, and May was alſo rainy; the conſequence of which, in ripening our corn at harveſt, was this; the wheat ripened, and we were reaping it by the 27th of July; but the oats ripened not till the 18th of Auguſt, when I began to cut them; and the barley began to ripen not till the 26th of Auguſt, when I began to cut the barley; ſo there was near three weeks diſtance between the wheat and oat-harveſt, and near a month's diſtance between the wheat and barley-harveſt. From hence I conclude (as it ſeems to me) with reaſon, that the colder and wetter a ſpring happens to be, and the longer it continues ſo, there will be the longer diſtance of time between the wheat, oat, and barley-harveſt; for the wheat being a hardier grain, and being ſtrong and well rooted at the ſpring of the year, is not pinched by a wet and cold ſpring, nor kept back in growth, as the oats and barley are, they being tender grains and their roots weak at that time of the year; and (vice verſâ) hot ſprings may ripen the barley before the wheat, as it ſtands in more need of warmth, and is more ſenſible of it than the laſt mentioned grain.

Of wet winters.

§. 8. Laſt winter (1702) was a very wet winter, and May and June following were alſo very wet, which made corn yield very ill: I infer, if the next winter and ſummer ſhould prove as wet, and yet not wetter, corn will prove thinner and yield worſe, and be dearer than in the former year; becauſe that year came after a very dry ſummer, for which reaſon the corn fared the better; but it is a great diſadvantage for land to wear wet cloaths to it's back two years together: the more years prove ſo unſeaſonable, the more and more will the land be poiſoned.

It is a common imagination of the farmers in the hill-country, when much and almoſt continual rains fall for a good part of the winter, that it will make corn dear, whereas I have commonly found them diſappointed in ſuch their expectations, and that the lands in the vale do not ſo much ſuffer, through a rainy winter, as they imagine, nay not ſo much as the high hill-country lands, if the ground be of a cold clay: for the vale lands, though they lie low, and are thereby ſubject to be wet, yet, for the moſt part, are warm in their nature, by reaſon of a mellow hollow texture, whereby they ſoon recover and grow dry after the winter is gone off, the ſun and wind piercing into them, eſpecially if the ground of the vale be good, as it uſually is much better than that of the hills: in ſuch caſe, by it's own vital heat and ſpirit it reſiſts the chill of the winters, and ſoon recovers itſelf again; whereas lands of the high hill-country, eſpecially the clays, being of their own nature much poorer, and more out of heart than thoſe of the vale, do more in that reſpect ſuffer by winter cold rains, and, by reaſon of their heavy and cloſe obſtinate texture, do much longer retain the water in them after the rainy ſeaſon is over; by which means I have often obſerved, that, if cold rains return on the back of the former, the corn of ſuch cold clays on the hills, being ſtill ſickly through the former wet, often dies; whereas that of the vale ſooner recovering (as I ſaid before) the chill of the former wet, has got ſome days ſtrength and refreſhment to bear up againſt the cold poiſon of the ſecond rainy ſeaſon which ſo ſoon returns after the former.

That winter wet is not reckoned to harm wheat by ſogging the roots of it, anſwerable to the wetneſs of a March month, has this reaſon for it; becauſe the pores of the roots are, in a manner, quite choaked up in the winter, nor is the winter water active, becauſe there is not ſun enough to attenuate it's parts, and to make them penetrate the tubes and roots of the wheat; whereas, when the month of March comes, the ſun has got ſtrength, and has opened the porous roots of the plants, and has attenuated the juices, which are therefore drank in greedily, and at this time the ſun has not yet got power enough to qualify this dropſy by it's heat, by drying up the waters, &c.

Of rain after ſowing.

§. 9. I obſerved, at one end of a field, that my barley looked much more ſickly and thinner (when ſowed a month or ſix weeks) than the reſt, but remembered that very patch had been dunged the year before for the wheaten crop much more than any part of the field, at which I wondered; but was told, that that patch was ſowed, and before it was harrowed wet came, ſo that the ground was chilled and did not harrow well; ſo much the good condition of corn depends on theſe two things.

Of cold nights in hill-country.

§. 10. I do conceive the coldneſs of the nights, (where the ground is cold clay, and the country high ſituated and hilly) does moſt contribute to the coarſeneſs of the corn; for the ſummer days (tho' the cooleſt) are ſomewhat refreſhing to corn as well as man, but the nights are many times of ſo cold a degree as to check the vegetable progreſſion; eſpecially, when there has been rain from a cold corner, and a cold ſoil for the corn, ſuch cold of the night being of a degree beyond what the corn can ſupport itſelf under, it is pinched thereby.

§. 11. On

Cauſe of rain falling in the vale.

§. 11. On ſeveral years experience I find, that on our high hills, ſituated near a vale (eſpecially in the ſpring time of March, April, and perhaps May, when the air is cold, dry, and windy, and of a harſh aſtringent temper, as uſually it is at thoſe times of the year: or, in fewer words, when the weather glaſs imports dry weather, for to that temper of the air I conceive the cauſe following is aſſignable) it is to be obſerved, that though there be large floating clouds boding rain, that riſe and paſs on one after another, watering liberally ſome parts of the earth over which they paſs; yet that ſuch clouds at thoſe times of the year ſeldom empty themſelves on our hills, but on the vales, whilſt we, enviouſly, at a diſtance look on our neighbours happineſs: this ſeems to be, becauſe the air, being, as before mentioned, dry and thin, has more elaſticity in it, and conſequently gives a greater reſiſtance to the clouds driven on by the winds, ſo that the clouds are eaſily diverted and turned aſide into the ſtronger channel of the wind in the vale under the hills, and therefore our expectation from the clouds riſing from the horizon big with rain, at thoſe times of the year, are generally vain: whereas I obſerve, on the contrary, when the air is loaded with moiſture, as may be ſenſibly perceived by the dampneſs of moſt things, and by the weather-glaſs being low, that ſuch clouds before mentioned, ſhall keep their ſteady courſe towards us, in an impartial manner, according to the tendency of the air and wind at that time; ſo that every cloud moves in a direct line without making a curve, or yielding to the vortex of the vale, and then we have a ſhare of the rain with our neighbours. This ſeems to depend on the yielding temper of the air, whoſe tention, by the moiſture, being unſtrung, and it's elaſtic power being loſt, the clouds meet with leſs reſiſtance, and ſo purſue a more ſteady direct courſe, and are leſs drawn off and ſollicited by the collateral current of air in the vale, but take their courſe purſuant to the direction of the wind behind them, the air before them eaſily yielding.

Indication of rain.

§. 12. From conſtant experience I have concluded, that, if the air be ſultry and gloomy, without a breath of wind or very little, the ſky full of light wool-pack clouds boding no rain, yet in ſuch caſes fierce ſhowers are very near, ſuitable to the gloomineſs and ſultrineſs that forerun: for the clouds moving towards you, though not above your horizon, according as they are larger, ſtop the current of the air; whence ſuch a cloſeneſs happens, that breathing, on ſuch approaching weather, is not ſo eaſily performed, and from the atmoſphere being full of ponderous clouds, it happens that the heat of the ſun-beams, on us, muſt be very intenſe, when they are collected and contracted into narrower ſpaces, and either paſs through the concave clouds, or are reflected from them, or break through the narrow interſpace only between the clouds, which makes thoſe ſcalding uneaſy heats: then in ſuch caſes, tho' no threatening cloud appears in ſight, yet be aſſured that rains are not far diſtant, and in an hour's time you may be likely to be ſurprized; then govern yourſelf accordingly for that whole day, whether it be in harveſt or hay-making time, or when any buſineſs may ſuffer by rain, and lay not yourſelf open to the power of fierce rains to hurt you, but be on your guard, and forecaſt the moſt advantageous game you can play, on the certain expectation of haſty ſhowers, and let not the fallacious opinion of the labourer, in harveſt or hay-making, deceive you, who thinks rain is far off, becauſe no cloud is near, and a pretty clear ſky.

Of rain in hot climates.

§. 13. It is an inſtance of great providence, that in the hot climates God ſends rain but ſeldom, unleſs the firſt and latter rain, to bring up the corn and ripen it, and to bring it out of the hoſe; for did it rain frequently there, as in England, &c. the corn would run up to ſuch a height as to lodge and rot.

Of the moon's influence.

§. 14. By what I can collect from the antients, they certainly thought the moon had a conſiderable heat, more or leſs, according to it's increaſe or decreaſe, and in that ſenſe the expreſſion of Columella muſt be underſtood;—ſol & luna COQUUNT, for Virgil applies the ſame to the ſun,

> " Glebaſque jacentes
> " Pulverulenta COQUAT maturis ſolibus æſtas;"

and what elſe can that verſe in the Pſalms ſignify; " The ſun ſhall not BURN thee by day, nor the MOON by night?" With regard to it's power and influence, ſublunary things ſeem to have a force and ſtrength increaſing as the moon increaſes, and a force and ſtrength decreaſing as the moon decreaſes; and this is more viſible or intelligible in things weak of themſelves, which are more eaſily affected, ſuch as are ſeeds ſown, which are young and tender, children ill, ſick perſons, perſons weak in their underſtandings, and conſequently in the ſpirits, perſons weak in their eyes, and conſequently in the local animal ſpirits of that part, which have not a good influx; thus we ſee it is in a moon-blind horſe; but, if ground be ſtrong, I believe it is not much in the power of the moon to affect the ſeed, as ſtrong-conſtitutioned perſons are not affected much with weather, good or bad, whereas valetudinarians muſt live by rule; for I apprehend the influence of the moon to be no more than what ſhe has by her borrowed light; the increaſe or decreaſe of which, when the ſun is withdrawn from us, may ſenſibly affect things weak, to their comfort or diſcomfort; and the juices in the plants and ſeeds, and ſpirits in our bodies may rationally and experimentally enough be allowed to move briſker, or the contrary, as her borrowed light is greater or leſs: perſons who, through a laxity of muſcles, ſtammer, are obſerved, the wind being ſouth, or ſouth-weſt, which relaxes, more to ſtammer; but ſuch winds affect not the ſpeech of other perſons, who at other times pronounce diſtinctly.

Of the wind.

§. 15. The wind moving the plants, and blowing them to and fro, ſeems, as Sir Francis Bacon has obſerved, to be the ſame towards ſtrengthening the fibres and ſolids of plants, as exerciſe is to us.

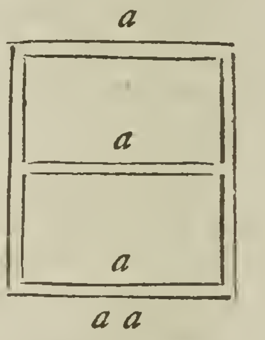
ENEMIES to HUSBANDRY.

Of foxes. §. 1. MR. Biſhop of Dorſetſhire, his ſhepherd, and his carter told me, that in lambing-time, and whilſt the lambs might be in danger of the fox, they ſend out a couple of fellows with horns all night to walk about, and blow and halloo, and on theſe nights ſtake down a couple of dogs, at fit diſtance, in a bleak cold place, which will make them bark all night; but that way, the ſhepherd ſays, will not always do, but a lamb however will be loſt ſometimes; nor can the ſame dogs abide it for above two or three nights; for then they will be ſo cramped as not to be able to get over a ſtile for two or three days afterwards: theſe men, who walk about, have ſixpence a night, and meat and drink; they muſt not walk about with a dog, for by ſo doing the ſheep will be ſet o' bleating and running as much as if the fox was amongſt them; ſo that they would not know when the fox came, which by the diſturbance among the ſheep may be known; nor will they, after he has been with them, be quiet from bleating till every ewe has got her lamb.

Another, a gentleman farmer of that county, aſſured me, he drew his flock together within two acres of ground almoſt as cloſe as if he had folded them; and ſet four dogs, ſtaked down at each corner, to keep off the fox by barking all night, and yet the foxes ſtole away that night two lambs, and bit a third.

Hares. §. 2. I obſerved in the barley ſeveral full-grown ears withered lying along in a track of the field, which ſeemed to be a great ſpoil; I took them up, and found the hares, to make a more convenient track, had bit the ſtraws off at the ground.

Moles. §. 3. The ſquare of timbers I ſaw in the Iſle of Wight, to cut mole-hills off, were ſix feet and a half in length, and the plate of iron about two inches broad, and ſharpened as a knife is, from the back to the edge; and made after this faſhion, *a* the joiſts, if one may ſo call them, acroſs, which are ſloped all away upwards, ſo as with the flat ſide they lie on the ground and are ſharp; all the pieces of timber are much of the ſame bigneſs, about half a foot broad and four inches, or better, thick, and the plate of iron ſet on the uppermoſt ſide of the lowermoſt bar, marked *a a*, hangs a quarter of an inch with the ſharp edge over that bar of timber.



Mice. §. 4. In taking down a reek-ſtaffold of wheat, I obſerved (as at other times) the mice for the greateſt number by much lay on the ſouth-weſt ſide of the reek, from which corner comes moſt rain and moiſt air, of which they may drink; this reek was carried up to a center like a cockpit, thatched as well, to my neighbouring farmer's judgment and mine, as ever we ſaw a reek; yet theſe mice had opened holes in the center top, and hollowed it in ſuch manner, in order to come at the water, that, being a wet winter and ſummer, much rain had fallen in and done conſiderable damage; ſo that the top thatch of reeks is to be looked after, where mice are ſuſpected to be.

To my great ſurprize I find, that mice will not eat the hulled hop-clover ſeed, but will ſcoop out all the flour of the broad-clover ſeed, and, to amazement, will not leave one ſeed in a buſhel, but what is thus ſcooped, in a ſhort time.

Rooks.

§. 5. This day (April the 24th) I obſerved the rooks, in my garden, to pull up the beans when they were come up green; they pull at the green ſtalk, and, if the ground be looſe, the bean-ſeed but little waſted comes up with it. Corn was almoſt all ſowed now throughout the country, which I believe made them apter to fall on the beans: and in the afternoon of this day I obſerved the barley juſt coming up out of the ground, and a parcel of rooks lying thereupon, with their heads going apace up and down from the ground; I went to the place, and found they had been pulling up the blades of corn, with which often, eſpecially with a little ſcratching, came up the ſeed itſelf, little waſted, and only ſwelled, the blade but juſt appearing: note, my ground being rolled, they could not ſo well draw the grain after the blade, and on that account grew, I believe, ſooner weary: the reaſon why they fell on the barley was, I ſuppoſe, the ſame for which they fell on the beans, viz. all corn being ſowed, they could, for a few days, make better wages in fiſhing after the corn thus than in looking after the looſe grains above ground.

In Wiltſhire, at Holt and thereabouts, I obſerved boys keeping off rooks from peas in the fields after they were come up; upon inquiry I found it was neceſſary, if peas came up before other corn was ſowed, which was uſual in thoſe parts. It is not ſo in our hill-country, becauſe we are ſowing black oats in abundance before our peas appear; but if I ſow the great cotſhil-pea, which I intend to do, which muſt be ſowed very early, and come up before other corn is ſowed, I muſt have, I find, the rooks kept off, or elſe, if I ſhould go from home for three or four days without taking care about it, they may be all pulled up before I return.

Rooks and pigeons.

§. 6. The deſtruction that pigeons and rooks make is incredible; a neighbouring farmer aſſures me, that he has known an acre ſowed with peas, and a rain coming ſo that they could not be harrowed in, every pea was fetched away in half a day's time by the pigeons.

I ſowed wheat very early (viz. by the 3d of Auguſt) which was before the wheat harveſt opened; the rooks, having no other corn to prey on, laid on it, and devoured a great quantity: but they do moſt harm, when, in the winter-time, the ſnow lies on the green wheat, and is firſt going off; for having had no food for ſome time, they fall then very greedily on the wheat.

[a] Rooks, if they infeſt your corn, are more terrified, if in their ſight you take a rook, and, plucking it limb from limb, caſt the ſeveral limbs about your field, than if you hang up half a dozen dead rooks in it; this Mr. Ray ſays in two or three leaves of Remarks on huſbandry, fol. 194, in his Etymology of words.

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[a] Among the many contrivances to frighten rooks, ſays Mr. Tull, as feathers ſtuck up, the limbs of rooks ſcattered about the ground, dead rooks hung on ſticks, the gun, or a boy to halloo, or throw up his hat, or a dead rook in the air, I have found the laſt to be the moſt effectual.

The grain of my wheat began to harden in the ear, and the rooks to gather to it: I was ſaying to my bailiff, that it would be hard to keep them from it, unleſs two men compaſſed it with guns; but he anſwered, it was a field of whoſe haunt the rooks might eaſily be broken, for, ſaid he, there is only a dead hedge for a few * lug on one ſide, all the reſt is quick hedge, and if you frighten them there, they will fly off to another haunt; a rook does not like to come to corn, but where there is a dead hedge, for they muſt be out upon the watch (and they do not care to light upon a quick hedge) to tell tidings: but crows will often light on the quick: I obſerved this year towards harveſt, that the rooks gathered much about thoſe corn grounds where my ponds were, to rendevouz and drink, and ſo to the corn again; therefore break them of their haunts early there, before the corn ripens.

* Pole.

Rooks will not pull up the lenten corn till ſeed-time is over, and there is not grain for them; and they ſeldom care for peas in the grain, nor barley as long as they can come at oats: for the oat ſtripped of it's huſk is much ſweeter, and tenderer to be bruiſed than barley, but when it is come up into blade, then they will moſt fall on barley; being laſt ſowed, and a fuller bodied grain, there is more flour left in the barley than in the oat; when they fall on the barley in the ear it is in light ground that is hollow, where it is * more-looſe; if peas were ſowed late, without doubt they would ſooner fall on their blade, and pull them up than other corn, becauſe of the bulk of their grain, in which there is more flour to be found unexhauſted; and I do remember, they fell on gore-vetches, that were ſowed in May, with that voraciouſneſs that it was very hard to ſecure half of them: in ſome grounds, which they take to, one may gather in the compaſs of a yard a handful of blades they have pulled up:—it is true, pigeons love peas beſt, which may proceed from the weakneſs of their bills that they cannot unſhell the oat, and from the heat of their crops, which may digeſt a pea better than the rooks can.

* Looſe at root.

It had been an exceſſive dry ſummer from April to this day (7th of July) and tho' there were no worms nor bugs, by reaſon of the drought, to be met with, yet the birds did not fall on the cherries, which I and others wondered at, but probably it was becauſe there was ſo much corn ſown about the houſe; but, where the ſummer is ſo very dry that rooks cannot come to worms, nor the plough go to turn them up, they will fall on the corn before it is half ripe, even when they can have but a green juice in the ſtraw to chew, therefore are to be prevented.

Rooks and ſparrows.

§. 7. A farther evil there is in rooks, that their neſts, when their breed is over, is a harbour to the latter brood of the ſparrows, which bird chooſes then, when the weather grows warm, and the air mild, to build ſub dio, and not to ſtive herſelf up in neſts under the eaves of a houſe.

Snails.

§. 8. In September I found many ſnails eggs laid at the roots of plants I pulled up: the 21ſt of October in rainy weather I obſerved a multitude of white ſnails or ſlugs, crawling on the ground, under the cabbages in the garden, moſt of which were not half ſo long as my nail, and in thickneſs no bigger than a pin's head; ſo that I concluded them newly hatched from the September eggs; therefore it is ſeaſonable to deſtroy the old ones before September, in order to deſtroy the brood. Quære, if they lay eggs any other months of the year; if ſo, to be chiefly taken off before ſuch laying alſo.

In February I planted cabbages, and by the latter end of March had moſt of them eat up by white ſnails, or ſlugs, of which ſort of ſnails we picked up a quart or more in a morning early for many mornings; the country was this year much infeſted with them; this evil ſeems to have proceeded from the very mild winter, which did not deſtroy the eggs they lay every autumn in abundance at the roots of all manner of herbs: the ſame is to be expected another mild winter, therefore look after them early in the ſpring.

Worlidge (fol. 262) ſays, that ſnails are of both ſexes, and couple from ſpring until Midſummer and after, and lay their eggs in the ground; you will find them with their bodies buried in the warm duſt, and only their ſhells above the ground; when you take them out you muſt rake out their eggs and deſtroy them, or elſe ſome will be hatched the ſame year, and ſome in the ſpring following.

§. 9. Ants, in the hotter regions, are reckoned among the peſts of the field, as in Italy, Spain, and the Weſt-Indies. Mortimer, fol. 253. Ants.

One Timothy Skrine (a very induſtrious and laborious perſon in planting orchards, and my neighbour in Wiltſhire, who from an eſtate of ten pounds per annum, improved it that way to fifty pounds per annum) came to ſee me in Hampſhire, and walking out with me in my meads, and obſerving the emmet-caſts, he told me, he had tried many ways to deſtroy them, being much troubled with them, and particularly the opening their hills in winter, which they would rebuild again; (I ſuppoſe at winter they lie lower than people uſually dig after them, therefore that way is unſucceſsful) but that the beſt way, as he has by experience found, is to fling abroad their hillocks in the month of June, in their breeding time, when they lay their eggs, before they come to be flies: I ſuppoſe this deſtroys their breed, puts them on endleſs labour to find them out, till they are hunger-ſtarved, and, the brood being deſtroyed, the old ones (who are not I imagine long-lived) decay, and die in a ſhort time; or perhaps they leave their habitations out of reſentment for the cruel uſage of their young, God having with his firſt bleſſing at the beginning implanted in all creatures an earneſt deſire of propagating and protecting their ſpecies; and we ſee the moſt fearful of them will venture their lives for their young ones; and it has been known, when perſons would deſtroy rookeries by firing at the old ones daily, it could not be done, but, when the neſts with young ones have been brought down, and burned under the trees, they have all deſerted.

§. 10. I made a gravel walk in my garden, and underlaid it with white mortar earth rammed in, and laid ſtrand on it; both coats were above a foot thick; notwithſtanding which the worms, in a few days time, made their holes through; I cannot ſuppoſe it poſſible for the worms to thruſt or bore thro' ſuch a ſolid with their ſnout; but having obſerved what a power they have with their mouth to pluck at graſs, do believe, in the ſame manner they uſe their Worms.

mouth in pulling away the earth in little crumbles, which they ſtill tumble downwards under them.

I made a little court with a gravel walk in the middle, and graſs-plots of turf on each ſide the walk: the worms came through the turf in vaſt numbers, and were very hurtful to it; the days being very rainy for a ſeaſon, which brought them out at nights; my ſervants viſited them with candle and lantern, and caught great quantities of them, till at length they grew ſo cunning that on ſtepping on the turf, though at great diſtance, they would feel the turf ſhake, and ſhoot into their holes; beſides, they would not, at their uſual hours, come out of their holes, nor then, as they uſually did before, lay out with moſt part of their bodies, but with their noſes only; obſerving the improveable wiſdom of theſe inſects, I thought to be cunninger than they, and made ſure of taking thoſe that lay within my reach on each ſide of the walk; for the gravel walk laid lower than the turf, and, being a ſolid, did not ſhake the turf, ſo I carried, as I ſtood in the walk, my candle and lantern over the turf as far as I could reach, but the worms being uſed to the light ſhot into their holes as ſoon as ever the rim of light came over them; I ſuppoſe they have no eyes, but God has given them an exquiſite feeling to ſupply that defect, in many reſpects, in order to ſelf-preſervation. Light being a fluid body makes a different configuration of the particles of the air, which they can diſtinguiſh by the feel, as a blindman can by uſe ſome colours; at laſt I found the way to deſtroy them was, to viſit them very early in the morning, in copulation, when I found they had a ſtupor; which put me in mind of that ſaying of Pliny, omne animal poſt coitum triſte.

I have a clay ſo obſtinate about my houſe, for a quarter of a mile's compaſs, and withal ſo flinty, that I am ſure a mole could never come within that ſpace, and yet, if a ſtick be put in any place, and ſtirred about, the worms will riſe and come forth, for fear of the mole, which ſeems to be purely owing to the enmity God has ſet between the worm and the mole from the beginning; for it muſt proceed from ſomewhat innate, that a creature, which had never, in the grounds here mentioned, experience of harm in this kind, ſhould blindly uſe this ſtratagem.

It is a common proverbial ſaying of the countryman, that at whatſoever country-farm a colony of rooks plant themſelves, and make a rookery, it is a ſign of good luck, and good fortune attending that man; and on men growing unfortunate, and low in the world, the rookery has been obſerved to forſake ſuch farm: for both which obſervations ſome good reaſons may be offered; viz. it is certain where a man is a good huſband to his land and improves it, the worms alſo (a great food to theſe creatures, eſpecially at ſome times of the year) multiply, and grow alſo to a much greater bulk and fatneſs; the ſtrength of land being as diſcernable by the large ſize of worms as from the growth of plants, and the beetle kind, on whoſe grubs or maggots, therefore called rook-worms, the rooks do greatly feed, (as is apparent by their following the plough) do not only grow in ſuch ground much fatter and larger, but thoſe flies of the beetle kind, by the wiſdom God has given them, do covet and choofe to neft their fly-blows in fuch land as will beft nouriſh and provide for them; and the ſame inſtance of the wiſdom of theſe creatures may be given in many like caſes; but, where an ill huſbandman comes, the contrary to this ſoon comes to paſs, upon which, no wonder if they ſay, let us go hence.

Upon viewing a farm in the Iſle of Wight, to purchaſe it, we were afraid the farmer, according to the liberty he had by his leaſe, would have ploughed up the cow-leaſe; farmer Collins ſaid, if it was his he ſhould hardly do it; for, ſaid he, good ſweet cow-paſture ground, that has laid to graſs a long time, is (in the Iſle of Wight) very ſubject to the worm, which will eat up the corn; it was a ſurprize to me to hear him ſay ſo, and therefore I inquired more particularly about it; he ſaid, the worm was very ſmall, with a black head, like a fly, and when their wheat, about March, ſhould promiſe exceeding well, it would die away on a ſudden; take up ſuch green wheat by the root, and juſt above the root and grain, within the earth, one may obſerve the ſtalk almoſt bit in two, and very commonly the worm upon it, and freſh ground is very ſubject to it, for the two or three firſt crops; I aſked him if it ever fared ſo with their barley; he ſaid, he never knew the barley to receive damage by it, but he had known the peas receive the ſame damage as the wheat. Mr. Rowler, an experienced yeoman, was preſent, and confirmed what Collins ſaid.

Rook-worms.

§. 11. If ground be infeſted much with rook-worms, ploughing it up will cure it of them for ſome years.

Of the eggs of inſects.

§. 12. I was at lord Pembroke's, and his lordſhip was diſcourſing about inſects and their eggs, and propagation; he ſaid, that many of their eggs which were laid late, did lie out all the winter, and were not brought to perfection till ſpring; therefore it is obſerved, that, where there is a cold winter, there is a leſs increaſe of thoſe inſects.

Nut-maggot.

§. 13. The wiſdom of God is very manifeſt in that contemptible inſect we call a maggot, and in the fly that blows it in the nut: I do not remember that ever I ſaw two maggots in a nut, though moſt nuts in a bunch are faulty where one is ſo; it ſeems the maggots of the whole bunch are the blowing of one and the ſame fly, and that all the nuts of the ſame bunch would have been blown, if ſome accident had not diſturbed the fly at the time of her incubation, for that a fleſh-fly does at the ſame time lay many eggs is certain: again, it may ſeem ſtrange, that one and the ſame fly ſhould diſcern (it being an act of almoſt the ſame inſtant of time) where ſhe blowed her maggot, ſo as not to lay another in the ſame nut; yet it ſeems ſtranger, that every other fly ſhould diſcern where a former had blown a maggot, ſo as to avoid laying her fly-blow on the ſame nut; otherwiſe it would afterwards happen that many maggots would be in the ſame nut, and the proviſion of maintenance fall ſhort: where the fly-blow is injected, when the nut is very ſmall and tender, a canker grows over and cloſes, and conſiſts of a rotten ſubſtance; and here it ſhews wiſdom alſo in a maggot, that it can diſcern that eaſier place of entrance.

Caterpillars.

§. 14. I obſerved this day (the 11th of Auguſt) a multitude of young caterpillars on the leaves of my turnips half-grown; all the ſaid half-grown leaves they had almoſt eaten up: note, the ſummer being very hot from April to this day, I conclude the latter brood of autumn was ripened alſo the ſame year, the eggs of which would otherwiſe have laid in the ground till next winter, theſe will be deſtroyed the next cold rains: from hence I conclude we ſhall have the fewer inſects next year: it was a new thing to me at this time of the year to meet with ſuch an enemy.

I obſerved this year (1709) in my walks among apple-trees and codling-hedges, that ſome apple-trees were ſmitten with the blight, as the country people call it, when their leaves are eaten up with the caterpillar, whilſt I obſerved that the reſt were under a flouriſhing and green verdure, and untouched by the caterpillar; and I was told by the owners that ſuch trees were moſt years ſo ſmitten; this occaſioned ſome ſpeculation and ſcrutiny, but I ſoon judged the reaſon of it; for I perceived a difference in the colour and ſhape of the leaves, between the blighted and unblighted trees, and upon inquiry found them to bear different fruits, and, if of the ſame ſort there were any blighted (which rarely happened when others eſcaped) I found, by reaſon of the different ages or unthriving condition of theſe trees, they had put out their leaves earlier or later than the others, and ſoon perceived that ſome trees, by bearing ſweeter leaves than others, were more ſuitable to the tooth of the caterpillar, or by bearing earlier or later, were more ſuitable as well as more tender at the time the caterpillar was to be fed, and that ſuch fly laid her eggs on ſuch trees (by the wiſdom appointed ſuch inſects by Providence) on which the worm (i. e. the caterpillar) when hatched and grown to maturity, might have it's beſt maintenance.

Caterpillars and flies.

§. 15. A notable fellow (though a labourer only) in huſbandry, drove a yoke of oxen from the neighbourhood in Wiltſhire where I have concerns (viz. Bradford and Trowbridge): I walked him about to ſhew him my corn, and an occaſion offered to diſcourſe on peas: I aſked him if they were not often eaten up by a caterpillar in Wiltſhire; he ſaid, in caſe the peas grew into a good halm, and blowed well, they never doubted a good crop of peas in their neighbourhood, for he never knew peas hurt by caterpillars in their country; but about fourteen years ago there was a winged fly, a ſort of locuſt, which did them damage: I replied, I ſuppoſed they ſowed peas ſo early as to eſcape the danger of the caterpillar by their forwardneſs before that inſect came; he ſaid, that was not his meaning, but the true reaſon for the eſcape of the peas, about them, was, becauſe ſo many elms, maples, and oaks grow about their grounds, which the fly (the parent of the caterpillar) who knows the tooth of her brood, prefers before the pea, and in the leaves of the ſaid trees lays her eggs: I take notice of this, becauſe it is agreeable to my own obſervation in former papers; and here the hand of God is very wonderful, to inſtruct the butterfly to chooſe ſuch plants, to lay it's brood in, as are beſt ſuited for their nouriſhment, whereas the butterfly judges not of it, nor chooſes it, by taſte, leaves of plants not being the food of thoſe flies, but the juices of flowers and honey-dews.

Graſs-louſe or locuſt.

§. 16. The green-louſe or locuſt falling on the broad ſide of the pea-kid, and thereupon the grain not thriving, ſeems an argument that the ſap, which nouriſhes the pea withinſide, is conveyed to the grain, and ſtrained through the fibres of the kid; for otherwiſe there is no reaſon why the pea ſhould ſuffer by this, ſeeing the ſpine, to which the pea adheres by a thread, is preſerved entire, and is joined to the main ſtalk; through this therefore the ſap might be conveyed directly, and without any prejudice to the pea, were it not firſt to be ſtrained through the fibres of the flat ſide of the kid.—This to be referred to what Malpigius has ſaid of the ſap's circulating through the leaves to the fruit.

The 13th and 14th of June, in pulling up wheat in ear, and ſowthiſtles, I did obſerve among the upper part of the roots of moſt of the wheat and ſowthiſtles, knots or cluſters of graſs-lice, or green locuſts (though theſe appeared whitiſh, being under ground, and as yet but juſt come to their ſhape) and amongſt moſt of theſe cluſters I obſerved a fly at her incubation, which ſeemed very turgid of a whitiſh matter, ſhe being then blowing theſe inſects; her wings were black, and the fly was plainly the ſame as the locuſts, only it had wings: I found at no root more than one fly.

Cuckow-ſpit.

§. 17. On May the 22d was the firſt cuckow-ſpit I had obſerved, which was on a woodbind joint; till within a day or two of that time there had been no rain or dews all April and May, and ſo whatever inſects of that kind were laid in the joints of plants could not live, but muſt be ſcorched up.

In the hiſtory of Works of the learned, for April 1707, I find Monſieur Poupart has given an account of the cuckow-ſpit, or ſpring-froth; he ſays, as ſoon as the little creature comes out of it's egg, it goes to a plant, which it touches with it's fundament, and faſtens there a white drop of liquor full of air; it drops a ſecond near the firſt, then a third, and ſo on, till it covers itſelf all over with a ſcum or froth; this froth keeps it from the heat of the ſun, or ſpiders that would ſuck it; note, this is not agreeable to my obſervation made in another place, nor can I agree with Mr. Poupart; for it is nothing but the nightly dew, which falls on the fork, or joint of the plant, which the little inſect with his proboſcis, as with a bellows, works into froth.

Of the fly in apple bloſſoms, &c.

§. 18. Being acquainted that a great blight was upon the apples, where I obſerved no leaves eat up by the caterpillar, I judged ſuch blight muſt be of another ſort, and upon inquiry (when none of the apples were bigger than gooſeberries, and the more backward much leſs) I found this blight was on the bloſſoms; for I found the bloſſoms had been cloſed up, and a cement bound the rims of their leaves together, and in the hollow incloſure was a fly, brown, and of a hazle colour, of hard wings like the beetle kind, of legs not ſhelly like theirs, and more nimble, of a neck as big as horſe-hair, and as long, near, as his body, at the end of which he bore a very ſmall head between two ſlender horns: where theſe bloſſoms were ſcorched up by the ſun and looked black, by reaſon of the time which had paſſed ſince their more early blowing, there I found the fly perfect, as before deſcribed; but in thoſe bloſſoms whoſe leaves were leſs dried, ſcorched, and ſun-burnt, which I took to be bloſſoms of more backward trees, there I found the fly as yet imperfect and unripe, with a yellow ſoft ſkin and helpleſs, but in a quick motion of it's body, it's legs and wings being as yet ſwathed up in this outward coat, which was by heat to ripen and crack: I perceived, by the degrees of the forwardneſs and backwardneſs mentioned of this inſect, that the fly which blowed them, muſt have ſeveral days for reigning, to do this miſchief, diſtant in time from each other: it was no cobweb as I could find, that cemented theſe leaves together as above mentioned; but I conceive it to be done by the heat of the ſun drawing away the tenuous parts from the dew of the flower, whereby the gummy ſubſtance quickly joined theſe leaves: it may be the fly took a blighting mildew air for the doing it: I believe this miſchief was done before the bloſſom opened itſelf fully, becauſe the cloſure and figure of it was in all like a bloſſom whoſe leaves cloſe at top before they are expanded. When the inſect grows to maturity, he eats a hole and goes forth: a vaſt miſcarriage fell on the fruit this way, more than in all other ways beſides; I found it the ſame in all gardens and orchards: note, the coſtermongers and cyder-men may enrich themſelves by an early foreſight of this, by buying up the apples; for the ſcarcity is to be foreſeen before the flower is full bloſſomed, whereas we do not uſually underſtand this miſchief till it is obvious to every eye.

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THE END.

E R R A T A.

PAGE 13, §. 20, line 8—and p. 16, §. 36, l. 5, for—rowty—read rowety or roweny.
69, note [g], l. 2, for—frumento—r. frumenta.
81, §. 24, l. 9, for—get—r. gets.
84, note, l. 2, for—ct—r. aut.
96, §. 61, l. 3, for—of ſowing—r. by ſowing.
146, l. 12, for—puctum—r. punctum.
160, §. 13, l. 3, for—oat a fortnight—r. oat cut a fortnight.
167, §. 11, l. 6, for—will not waſh—r. will waſh.
209, §. 4. l. 4, for—bud—r. butt.
245, §. 23, l. 14, for—colour—r. clover.
269, note, l. 2, for—hanc—r. hunc.
337, note, l. 5, for—herb—r. herbâ.
364, §. 22, l. 2, for—but I did—r. but he did.
367, §. 27, l. 22, for—has often—r. have often.
367, l. 31, for—with the cold—r. by the cold.
405, §. 10, l. 5, for—waſters—r. roaſters.